

Content Standards for Digital Geospatial Metadata

Federal Geographic Data Committee

June 8, 1994

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Department of Agriculture • Department of Commerce • Department of Defense • Department of Energy
Department of Housing and Urban Development • Department of the Interior • Department of State
Department of Transportation • Environmental Protection Agency Federal Emergency Management Agency • Library
of Congress
National Aeronautics and Space Administration • National Archives and Records Administration
Tennessee Valley Authority

Federal Geographic Data Committee

Established by Office of Management and Budget Circular A-16, the Federal Geographic Data Committee (FGDC) promotes the coordinated development, use, sharing, and dissemination of geographic data.

The FGDC is composed of representatives from the Departments of Agriculture, Commerce, Defense, Energy, Housing and Urban Development, the Interior, State, and Transportation; the Environmental Protection Agency; the Federal Emergency Management Agency; the Library of Congress; the National Aeronautics and Space Administration; the National Archives and Records Administration; and the Tennessee Valley Authority. Additional Federal agencies participate on FGDC subcommittees and working groups. The Department of the Interior chairs the committee.

FGDC subcommittees work on issues related to data categories coordinated under the circular. Subcommittees establish and implement standards for data content, quality, and transfer; encourage the exchange of information and the transfer of data; and organize the collection of geographic data to reduce duplication of effort. Working groups are established for issues that transcend data categories.

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Table of Contents

| | <u>Page</u> |
|---|-------------|
| Overview | v |
| Organization of the Standard | vii |
| 0 Metadata | 1 |
| 1 Identification Information | 3 |
| 2 Data Quality Information | 9 |
| 3 Spatial Data Organization Information | 15 |
| 4 Spatial Reference Information | 19 |
| 5 Entity and Attribute Information | 33 |
| 6 Distribution Information | 37 |
| 7 Metadata Reference Information | 45 |
| 8 Citation Information | 47 |
| 9 Time Period Information | 49 |
| 10 Contact Information | 51 |
| Appendixes | |
| A. Glossary | |
| B. Alphabetical List of Compound Elements and Data Elements | |
| C. References | |

1. Name of Standard. Content Standards for Digital Geospatial Metadata.

2. Explanation. This standard specifies the information content of metadata for a set of digital geospatial data. The purpose of the standard is to provide a common set of terminology and definitions for concepts related to these metadata. Metadata are data about the content, quality, condition, and other characteristics of data.

The Federal Geographic Data Committee (FGDC) initiated work on the standard in June, 1992, through a forum on geospatial metadata. At the forum, the participants agreed on the need for a standard on the information content of metadata about geospatial data. The committee accepted the offer of ASTM¹ Section D18.01.05 to develop a draft information content standard. This draft was slightly revised, and offered for public review from October 1992 to April 1993. Extensive comments were received from the public. The FGDC's Standards Working Group revised the draft. The revised draft was provided for further review and testing in July 1993. Refined drafts were offered for review and testing in January and March 1994.

3. Approving Authority. The Federal Geographic Data Committee approved the standard on June 8, 1994. The committee plans to submit the standard to the Department of Commerce for approval as a Federal Information Processing Standard.

4. Maintenance Authority. The current maintenance authority for the standard is the FGDC Secretariat. Questions concerning the standard are to be addressed to the FGDC Secretariat, in care of the U.S. Geological Survey, 590 National Center, Reston, Virginia 22092. The committee plans to designate an organization other than the secretariat as the maintenance authority as part of the process of submitting the standard for approval as a Federal Information Processing Standard.

5. Related Documents. A list of references is contained in Appendix C.

6. Objectives. The objectives of the standard are to provide a common set of terminology and definitions for the documentation of digital geospatial data. The standard establishes the names of data elements and compound elements (groups of data elements) to be used for these purposes, the definitions of these compound elements and data elements, and information about the values that are to be provided for the data elements.

The major uses of metadata are:

- to maintain an organization's internal investment in geospatial data,
- to provide information about an organization's data holdings to data catalogues, clearinghouses, and brokerages, and
- to provide information needed to process and interpret data to be received through a transfer from an external source.

The information included in the standard was selected based on four roles that metadata play:

- availability -- data needed to determine the sets of data that exist for a geographic location.
- fitness for use -- data needed to determine if a set of data meets a specific need.
- access -- data needed to acquire an identified set of data.
- transfer -- data needed to process and use a set of data.

¹-formerly the American Society for Testing and Materials.

These roles form a continuum in which a user cascades through a pyramid of choices to determine what data are available, to evaluate the fitness of the data for use, to access the data, and to transfer and process the data. The exact order in which data elements are evaluated, and the relative importance of data elements, will not be the same for all users.

7. Applicability. This standard is for the documentation of geospatial data.

Executive Order 12906, "Coordinating Geographic Data Acquisition and Access: The National Spatial Data Infrastructure," was signed on April 11, 1994, by President William Clinton. Section 3, Development of a National Geospatial Data Clearinghouse, paragraph (b) states: "Standardized Documentation of Data. Beginning 9 months from the date of this order, each agency shall document all new geospatial data it collects or produces, either directly or indirectly, using the standard under development by the FGDC, and make that standardized documentation electronically accessible to the Clearinghouse network. Within 1 year of the date of this order, agencies shall adopt a schedule, developed in consultation with the FGDC, for documenting, to the extent practicable, geospatial data previously collected or produced, either directly or indirectly, and making that data documentation electronically accessible to the Clearinghouse network." This standard is the data documentation standard referenced in the executive order.

In addition to use by the Federal Government, the FGDC invites and encourages organizations and persons from State, local, and tribal governments, the private sector, and non-profit organizations to use the standard to document their geospatial data. A major difficulty in the geospatial data community is the lack of information that helps prospective users to determine what data exist, the fitness of existing data for planned applications, and the conditions for accessing existing data, and to transfer data to a user's system. This standard, developed with aid of broad public participation, will help to ease these problems and to develop the National Spatial Data Infrastructure.

The standard was developed from the perspective of defining the information required by a prospective user to determine the availability of a set of geospatial data, to determine the fitness the set of geospatial data for an intended use, to determine the means of accessing the set of geospatial data, and to successfully transfer the set of geospatial data. As such, the standard establishes the names of data elements and compound elements to be used for these purposes, the definitions of these data elements and compound elements, and information about the values that are to be provided for the data elements. The standard does not specify the means by which this information is organized in a computer system or in a data transfer, nor the means by which this information is transmitted, communicated, or presented to the user.²

8. Specifications. The standard provides specifications for terminology of data elements and compound elements, definitions for this terminology, and information about values to be provided for the data elements. Information about terms that are mandatory, mandatory under certain conditions, and optional (provided at the discretion of the data provider) is provided by the standard.

9. Where to Obtain Copies. Copies of this publication are available from the Federal Geographic Data Committee Secretariat, in care of the U.S. Geological Survey, 590 National Center, Reston, Virginia 22092; telephone (703) 648-5514; facsimile (703) 648-5755; Internet (electronic mail) gdc@usgs.gov. The text also is available from anonymous File Transfer Protocol (anonymous FTP) server fgdc.er.usgs.gov.

²-The variety of means of organizing data in a computer, the differences among data providers to describe their data holdings because of varying institutional and technical capabilities, the rapid evolution of means to provide information through the Internet for different purposes, and the need to accommodate existing standards have guided the evolution of this decision. The FGDC is pursuing several implementation methods.

Numbered Sections

The standard is organized in a hierarchy of data elements and compound elements that define the information content for metadata to document a set of digital geospatial data. The starting point is "metadata" (section 0). The compound element "metadata" is composed of other compound elements representing different concepts about the data set. Each of these compound elements has a numbered section in the standard. In each numbered section, these compound elements are defined by other compound elements and data elements. The section "contact information" is a special section that specifies the data elements for contacting individuals and organizations. This section is used by other sections, and is defined once for convenience.

Each section begins with the name and definition of the compound element that defines the section. The name and definition are followed by production rules (see below) that define this compound element in terms of data elements, either directly or by the use of intermediate compound elements. When intermediate compound elements are used, the production rules for these elements also are provided in this part of the section.

The production rules are followed by a list of names and definitions of compound elements and data elements used in the section.

Compound Elements

A compound element is a group of data elements and other compound elements. All compound elements are described by data elements, either directly or through intermediate compound elements. Compound elements represent higher-level concepts that cannot be represented by individual data elements. The form for the definition of compound elements is:

Compound element name -- definition.
Type:compound

The type of "compound" uniquely identifies the compound elements in the lists of terms and definitions.

Production Rules

A production rule specifies the relationship between a compound element, and data elements and other (lower-level) compound elements. Each production rule has a left side (identifier) and a right side (expression) connected by the symbol "=", meaning that the term on the left side is replaced by or produces the term on the right side. Terms on the right side are either other compound elements or individual data elements. By making substitutions using matching terms in the production rules, one can explain higher-level concepts using data elements.

The symbols used in the production rules have the following meaning:

| <u>Symbol</u> | <u>Meaning</u> |
|---------------|---|
| = | is replaced by, produces, consists of |
| + | and |
| [] | selection - select one term from the list of enclosed terms (exclusive or). Terms are separated by " ". |
| m{ }n | iteration - the term(s) enclosed is(are) repeated from "m" to "n" times |
| () | optional - the term(s) enclosed is(are) optional |

Examples:

| | |
|-------------|-------------------------------|
| a = b + c | "a consists of b and c" |
| a = [b c] | "a consists of one of b or c" |

$a = 4\{b\}6$ "a consists of four to six occurrences of b"

$a = b + (c)$ "a consists of b and optionally c"

Interpreting the production rules:

- The terms bounded by parentheses, "(" and ")", are optional and are provided at the discretion of the data producer. If a producer chooses to provide information enclosed by parentheses, the producer shall follow the production rules for the enclosed information. For example, if the producer decides to provide the optional information described in the term:

$(a + b + c)$

the producer shall provide a and b and c.

Only for terms bounded by parentheses does the producer have the discretion of deciding whether or not to provide the information.

- The variation among the ways in which geospatial data are produced and distributed, the fact that all geospatial data do not have the same characteristics, and the issue that all details of data sets that are in work or are planned may not be decided, caused the need to express the concept of "mandatory if applicable." This concept means that if the data set exhibits (or, for data sets that are in work or planned, it is known that the data set will exhibit) a defined characteristic, then the producer shall provide the information needed to describe that characteristic. This concept is described by the production rule:

$0\{ \text{term} \}1$

Data Elements

A data element is a logically primitive item of data. The entry for a data elements includes the name of the data element, the definition of the data element, a description of the values that can be assigned to the data element. The form for the definition of the data elements is:

Data element name -- definition.

Type:

Domain:

The information about the values for the data elements include a description of the type of the value, and a description of the domain of the valid values. The type of the data element describes the kind of value to be provided. The choices are "integer" for integer numbers, "real" for real numbers, "text" for ASCII characters, "date" for day of the year, and "time" for time of the day.

The domain describes valid values that can be assigned to the data element. The domain may specify a list of valid values, references to lists of valid values, or restrictions on the range of values that can be assigned to a data element.

The domain also may note that the domain is free from restrictions, and any values that can be represented by the "type" of the data element can be assigned. These unrestricted domains are represented by the use of the word "free" followed by the type of the data element (that is, free text, free date, free real, free time, free integer).

Some domains can be partly, but not completely, specified. For example, there are several widely used data transfer formats, but there may be many more that are less well known. To allow a producer to describe its data in these circumstances, the convention of providing a list of values followed by the designation of a "free" domain was used. In these cases, assignments of values shall be made from the provided domain when possible. When not possible, providers may create and assign their own value. A created value shall not redefine a value provided by the standard.

Another issue is the representation of null values (representing such concepts as "unknown") in the domain. While this is relatively simple for textual entries (one would enter the text "Unknown"), it is not as simple for the integer, real, date, and time types (for example, which integer value means "unknown"?). Because conventions for providing this information vary among implementations, the standard specifies what concepts shall be represented, but does not mandate a means for representing them.

In addition to the values to be represented, the form of the representation also is important, especially to applications that will manipulate the data elements. The following conventions for forms of values for data elements shall be used:

Calendar Dates (Years, Months, and Days)

- A.D. Era to December 31, 9999 A.D. -- Values for day and month of year, and for years, shall follow the calendar date convention (general forms of YYYY for years; YYYYMM for month of a year (with month being expressed as an integer), and YYYYMMDD for a day of the year) specified in American National Standards Institute, 1986, Representation for calendar date and ordinal date for information interchange (ANSI X3.30-1985): New York, American National Standards Institute (adopted as Federal Information Processing Standard 4-1).
- B.C. Era to 9999 B.C. -- Values for day and month of year, and for years, shall follow the calendar date convention, preceded by the lower case letters "bc" (general forms of bcYYYY for years; bcYYYYMM for month of a year (with month being expressed as an integer), and bcYYYYMMDD for a day of the year).
- B.C. Era before 9999 B.C. -- Values for the year shall consist of as many numeric characters as are needed to represent the number of the year B.C., preceded by the lower case letters "cc" (general form of ccYYYYYYY...).
- A.D. Era after 9999 A.D. -- Values for the year shall consist of as many numeric characters as are needed to represent the number of the year A.D., preceded by the lower case letters "cd" (general form of cdYYYYYYY...).

Time of Day (Hours, Minutes, and Seconds)

- Because some geospatial data and related applications are sensitive to time of day information, three conventions are permitted. Only one convention shall be used for metadata for a data set. The conventions are:
 - Local Time. For producers who wish to record time in local time, values shall follow the 24-hour timekeeping system for local time of day in the hours, minutes, seconds, and decimal fractions of a second (to the precision desired) without separators convention (general form of HHMMSSSS) specified in American National Standards Institute, 1986, Representations of local time of day for information interchange (ANSI X3.43-1986): New York, American National Standards Institute (adopted as Federal Information Processing Standard 58-1).
 - Local Time with Time Differential Factor. For producers who wish to record time in local time and the relationship to Universal Time (Greenwich Mean Time), values shall follow the 24-hour timekeeping system for local time of day in hours, minutes, seconds, and decimal fractions of a second (to the resolution desired) without separators convention. This value shall be followed, without separators, by the time differential factor. The time differential factor expresses the difference in hours and minutes between local time and Universal Time. It is represented by a four-digit number preceded by a plus sign (+) or minus sign (-), indicating the hours and minutes the local time is ahead of or behind Universal Time, respectively. The general form is HHMMSSSSshhmm, where HHMMSSSS is the local

time using 24-hour timekeeping (expressed to the precision desired), 's' is the plus or minus sign for the time differential factor, and hhmm is the time differential factor. (This option allows producers to record local time and time zone information. For example, Eastern Standard Time has a time differential factor of -0500, Central Standard Time has a time differential factor of -0600, Eastern Daylight Time has a time differential factor of -0400, and Central Daylight Time has a time differential factor of -0500.) This option is specified in American National Standards Institute, 1975, Representations of universal time, local time differentials, and United States time zone reference for information interchange (ANSI X3.51-1975): New York, American National Standards Institute (adopted as Federal Information Processing Standard 59).

- Universal Time (Greenwich Mean Time). For producers who wish to record time in Universal Time (Greenwich Mean Time), values shall follow the 24-hour timekeeping system for Universal Time of day in hours, minutes, seconds, and decimal fractions of a second (expressed to the precision desired) without separators convention, with the upper case letter "Z" directly following the low-order (or extreme right hand) time element of the 24-hour clock time expression. The general form is HHMMSSSSZ, where HHMMSSSS is Universal Time using 24-hour timekeeping, and Z is the letter "Z". This option is specified in American National Standards Institute, 1975, Representations of universal time, local time differentials, and United States time zone reference for information interchange (ANSI X3.51-1975): New York, American National Standards Institute (adopted as Federal Information Processing Standard 59).

Latitude and Longitude

- Values for latitude and longitude shall be expressed as decimal fractions of degrees. Whole degrees of latitude shall be represented by a two-digit decimal number ranging from 0 through 90. Whole degrees of longitude shall be represented by a three-digit decimal number ranging from 0 through 180. When a decimal fraction of a degree is specified, it shall be separated from the whole number of degrees by a decimal point. Decimal fractions of a degree may be expressed to the precision desired.
 - Latitudes north of the equator shall be specified by a plus sign (+), or by the absence of a minus sign (-), preceding the two digits designating degrees. Latitudes south of the Equator shall be designated by a minus sign (-) preceding the two digits designating degrees. A point on the Equator shall be assigned to the Northern Hemisphere.
 - Longitudes east of the prime meridian shall be specified by a plus sign (+), or by the absence of a minus sign (-), preceding the three digits designating degrees of longitude. Longitudes west of the meridian shall be designated by minus sign (-) preceding the three digits designating degrees. A point on the prime meridian shall be assigned to the Eastern Hemisphere. A point on the 180th meridian shall be assigned to the Western Hemisphere. One exception to this last convention is permitted. For the special condition of describing a band of latitude around the earth, the East Bounding Coordinate data element shall be assigned the value +180 (180) degrees.
 - Any spatial address with a latitude of +90 (90) or -90 degrees will specify the position at the North or South Pole, respectively. The component for longitude may have any legal value.

With the exception of the special condition described above, this form is specified in Department of Commerce, 1986, Representation of geographic point locations for information interchange (Federal Information Processing Standard 70-1): Washington, Department of Commerce, National Institute of Standards and Technology.

Network Addresses and File Names

- values for file names, network addresses for computer systems, and related services should follow the Uniform Resource Locator convention of the Internet when possible. See <http://www.ncsa.uiuc.edu/demoweb/url-primer.html> for additional details about the Uniform Resource Locator.

Metadata

0 Metadata -- data about the content, quality, condition, and other characteristics of data.
Type:compound

Metadata =

Identification_Information +
0{Data_Quality_Information}1 +
0{Spatial_Data_Organization_Information}1 +
0{Spatial_Reference_Information}1 +
0{Entity_and_Attribute_Information}1 +
0{Distribution_Information}1 +
Metadata_Reference_Information

(Sections 1 through 7 define the terms on the right side of the production rule.)

Identification Information

1 Identification Information -- basic information about the data set.
Type:compound

Identification_Information =

Citation +
Description +
Time_Period_of_Content +
Status +
Spatial_Domain +
Keywords +
Access_Constraints +
Use_Constraints +
(Point_of_Contact) +
(1{Browse_Graphic}n) +
(Data_Set_Credit) +
(Security_Information) +
(Native_Data_Set_Environment) +
(1{Cross_Reference}n)

Citation =

Citation_Information (*see section 8 for production rules*)

Description =

Abstract +
Purpose +
(Supplemental_Information)

Time_Period_of_Content =

Time_Period_Information (*see section 9 for production rules*) +
Currentness_Reference

Status =

Progress +
Maintenance_and_Update_Frequency

Spatial_Domain =

Bounding_Coordinates +
(1{Data_Set_G-Polygon}n)

Bounding_Coordinates =

West_Bounding_Coordinate +
East_Bounding_Coordinate +
North_Bounding_Coordinate +
South_Bounding_Coordinate

Data_Set_G-Polygon =

Data_Set_G-Polygon_Outer_G-Ring +
0{Data_Set_G-Polygon_Exclusion_G-Ring}n

Data_Set_G-Polygon_Outer_G-Ring =

4{G-Ring_Latitude +
G-Ring_Longitude}n

Data_Set_G-Polygon_Exclusion_G-Ring =
 4{G-Ring_Latitude +
 G-Ring_Longitude}n

Keywords =
 Theme +
 (Place) +
 (Stratum) +
 (Temporal)

Theme =
 1{Theme_Keyword_Thesaurus +
 1{Theme_Keyword}n }n

Place =
 1{Place_Keyword_Thesaurus +
 1{Place_Keyword}n }n

Stratum =
 1{Stratum_Keyword_Thesaurus +
 1{Stratum_Keyword}n }n

Temporal =
 1{Temporal_Keyword_Thesaurus +
 1{Temporal_Keyword}n }n

Point_of_Contact =
 Contact_Information *(see section 10 for production rules)*

Browse_Graphic =
 Browse_Graphic_File_Name +
 Browse_Graphic_File_Description +
 Browse_Graphic_File_Type

Security_Information =
 Security_Classification_System +
 Security_Classification +
 Security_Handling_Description

Cross_Reference =
 Citation_Information *(see section 8 for production rules)*

2 Citation -- information to be used to reference the data set.
 Type:compound

3 Description -- a characterization of the data set, including its intended use and limitations.
 Type:compound

4 Abstract -- a brief narrative summary of the data set.
 Type:text
 Domain: free text

5 Purpose -- a summary of the intentions with which the data set was developed.
 Type:text
 Domain: free text

- 6 Supplemental Information -- other descriptive information about the data set.
Type:text
Domain: free text
- 7 Time Period of Content -- time period(s) for which the data set corresponds to the ground.
Type:compound
- 8 Currentness Reference -- the basis on which the time period of content information is determined.
Type:text
Domain: "ground condition" "publication date" free text
- 9 Status -- the state of and maintenance information for the data set.
Type:compound
- 10 Progress -- the state of the data set.
Type:text
Domain: "Complete" "In work" "Planned"
- 11 Maintenance and Update Frequency -- the frequency with which changes and additions are made to the data set after the initial data set is completed.
Type:text
Domain: "Continually" "Daily" "Weekly" "Monthly" "Annually" "Unknown" "As needed" "Irregular" "None planned" free text
- 12 Spatial Domain - the geographic areal domain of the data set.
Type:compound
- 13 Bounding Coordinates - the limits of coverage of a data set expressed by latitude and longitude values in the order western-most, eastern-most, northern-most, and southern-most. For data sets that include a complete band of latitude around the earth, the West Bounding Coordinate shall be assigned the value -180.0, and the East Bounding Coordinate shall be assigned the value 180.0
Type:compound
- 14 West Bounding Coordinate -- western-most coordinate of the limit of coverage expressed in longitude.
Type:real
Domain: $-180.0 \leq \text{West Bounding Coordinate} < 180.0$
- 15 East Bounding Coordinate -- eastern-most coordinate of the limit of coverage expressed in longitude.
Type:real
Domain: $-180.0 \leq \text{East Bounding Coordinate} \leq 180.0$
- 16 North Bounding Coordinate -- northern-most coordinate of the limit of coverage expressed in latitude.
Type:real
Domain: $-90.0 \leq \text{North Bounding Coordinate} \leq 90.0$;
North Bounding Coordinate \geq South Bounding Coordinate

- 17 South Bounding Coordinate -- southern-most coordinate of the limit of coverage expressed in latitude.
Type:real
Domain: -90.0 <= South Bounding Coordinate <= 90.0;
South Bounding Coordinate <= North Bounding Coordinate
- 18 Data Set G-Polygon -- coordinates defining the outline of an area covered by a data set.
Type:compound
- 19 Data Set G-Polygon Outer G-Ring -- the closed nonintersecting boundary of an interior area.
Type:compound
- 20 G-Ring Latitude -- the latitude of a point of the g-ring.
Type:real
Domain: -90.0 <= G-Ring Latitude <= 90.0
- 21 G-Ring Longitude -- the longitude of a point of the g-ring.
Type:real
Domain: -180.0 <= G-Ring Longitude < 180.0
- 22 Data Set G-Polygon Exclusion G-Ring -- the closed nonintersecting boundary of a void area (or "hole") in an interior area.
Type:compound
- 23 Keywords -- words or phrases summarizing an aspect of the data set.
Type:compound
- 24 Theme -- subjects covered by the data set (for a list of some commonly-used thesauri, see Part IV: Subject/index term sources *in* Network Development and MARC Standards Office, 1988, USMARC code list for relators, sources, and description conventions: Washington, Library of Congress).
Type:compound
- 25 Theme Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of theme keywords.
Type:text
Domain: "None" free text
- 26 Theme Keyword -- common-use word or phrase used to describe the subject of the data set.
Type:text
Domain: free text
- 27 Place -- geographic locations characterized by the data set.
Type:compound
- 28 Place Keyword Thesaurus -- reference to a formally registered thesaurus or a similar authoritative source of place keywords.
Type:text
Domain: "None" "Geographic Names Information System" free text
- 29 Place Keyword -- the geographic name of a location covered by a data set.
Type:text
Domain: free text

- 30 Stratum -- layered, vertical locations characterized by the data set.
 Type:compound
- 31 Stratum Keyword Thesaurus -- reference to a formally registered thesaurus or a
 similar authoritative source of stratum keywords.
 Type:text
 Domain: "None" free text
- 32 Stratum Keyword -- the name of a vertical location used to describe the
 locations covered by a data set.
 Type:text
 Domain: free text
- 33 Temporal -- time period(s) characterized by the data set.
 Type:compound
- 34 Temporal Keyword Thesaurus -- reference to a formally registered thesaurus or
 a similar authoritative source of temporal keywords.
 Type:text
 Domain: "None" free text
- 35 Temporal Keyword -- the name of a time period covered by a data set.
 Type:text
 Domain: free text
- 36 Access Constraints -- restrictions and legal prerequisites for accessing the data set. These
 include any access constraints applied to assure the protection of privacy or intellectual
 property, and any special restrictions or limitations on obtaining the data set.
 Type:text
 Domain: "None" free text
- 37 Use Constraints -- restrictions and legal prerequisites for using the data set after access is
 granted. These include any access constraints applied to assure the protection of privacy or
 intellectual property, and any special restrictions or limitations on obtaining the data set.
 Type:text
 Domain: "None" free text
- 38 Point of Contact -- contact information for an individual or organization that is
 knowledgeable about the data set.
 Type:compound
- 39 Browse Graphic -- a graphic that provides an illustration of the data set. The graphic
 should include a legend for interpreting the graphic.
 Type:compound
- 40 Browse Graphic File Name -- name of a related graphic file that provides an
 illustration of the data set.
 Type:text
 Domain: free text
- 41 Browse Graphic File Description -- a text description of the illustration.
 Type:text
 Domain: free text

- 42 Browse Graphic File Type -- graphic file type of a related graphic file.
 Type:text
 Domain: domain values in the table below; free text
- | Domain Value | Definition |
|--------------|---|
| "CGM" | Computer Graphics Metafile |
| "EPS" | Encapsulated Postscript format |
| "GIF" | Graphic Interchange Format |
| "JPEG" | Joint Photographic Experts Group format |
| "PBM" | Portable Bit Map format |
| "PS" | Postscript format |
| "TIFF" | Tagged Image File Format |
| "XWD" | X-Windows Dump |
- 43 Data Set Credit -- recognition of those who contributed to the data set.
 Type:text
 Domain: free text
- 44 Security Information -- handling restrictions imposed on the data set because of national security, privacy, or other concerns.
 Type:compound
- 45 Security Classification System -- name of the classification system.
 Type:text
 Domain: free text
- 46 Security Classification -- name of the handling restrictions on the data set.
 Type:text
 Domain: "Top secret" "Secret" "Confidential" "Restricted" "Unclassified" "Sensitive" free text
- 47 Security Handling Description -- additional information about the restrictions on handling the data set.
 Type:text
 Domain: free text
- 48 Native Data Set Environment -- a description of the data set in the producer's processing environment, including items such as the name of the software (including version), the computer operating system, file name (including host-, path-, and filenames), and the data set size.
 Type:text
 Domain: free text
- 49 Cross Reference -- information about other, related data sets that are likely to be of interest.
 Type:compound

Data Quality Information

50

Data Quality Information -- a general assessment of the quality of the data set.
(Recommendations on information to be reported and tests to be performed are found in "Spatial Data Quality," which is chapter 3 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology.)
Type:compound

Data_Quality_Information =

0{Attribute_Accuracy}1 +
Logical_Consistency_Report +
Completeness_Report +
0{Positional_Accuracy}1 +
Lineage +
(Cloud_Cover)

Attribute_Accuracy =

Attribute_Accuracy_Report +
(1{Quantitative_Attribute_Accuracy_Assessment}n)

Quantitative_Attribute_Accuracy_Assessment =

Attribute_Accuracy_Value +
Attribute_Accuracy_Explanation

Positional_Accuracy =

0{Horizontal_Positional_Accuracy}1 +
0{Vertical_Positional_Accuracy}1

Horizontal_Positional_Accuracy =

Horizontal_Positional_Accuracy_Report +
(1{Quantitative_Horizontal_Positional_Accuracy_Assessment}n)

Quantitative_Horizontal_Positional_Accuracy_Assessment =

Horizontal_Positional_Accuracy_Value +
Horizontal_Positional_Accuracy_Explanation

Vertical_Positional_Accuracy =

Vertical_Positional_Accuracy_Report +
(1{Quantitative_Vertical_Positional_Accuracy_Assessment}n)

Quantitative_Vertical_Positional_Accuracy_Assessment =

Vertical_Positional_Accuracy_Value +
Vertical_Positional_Accuracy_Explanation

Lineage =

0{Source_Information}n +
1{Process_Step}n

Source_Information =

Source_Citation +
0{Source_Scale_Denominator}1 +
Type_of_Source_Media +
Source_Time_Period_of_Content +
Source_Citation_Abbreviation +
Source_Contribution

Source_Citation =
Citation_Information (*see section 8 for production rules*)

Source_Time_Period_of_Content =
Time_Period_Information (*see section 9 for production rules*) +
Source_Currentness_Reference

Process_Step =
Process_Description +
0{Source_Used_Citation_Abbreviation}n +
Process_Date +
(Process_Time) +
0{Source_Produced_Citation_Abbreviation}n +
(Process_Contact)

Process_Contact =
Contact_Information (*see section 10 for production rules*)

- 51 Attribute Accuracy -- an assessment of the accuracy of the identification of entities and assignment of attribute values in the data set.
 Type:compound
- 52 Attribute Accuracy Report -- an explanation of the accuracy of the identification of the entities and assignments of values in the data set and a description of the tests used.
 Type:text
 Domain: free text
- 53 Quantitative Attribute Accuracy Assessment -- a value assigned to summarize the accuracy of the identification of the entities and assignments of values in the data set and the identification of the test that yielded the value.
 Type:compound
- 54 Attribute Accuracy Value -- an estimate of the accuracy of the identification of the entities and assignments of attribute values in the data set.
 Type:text
 Domain: "Unknown" free text
- 55 Attribute Accuracy Explanation -- the identification of the test that yielded the Attribute Accuracy Value.
 Type:text
 Domain: free text
- 56 Logical Consistency Report -- an explanation of the fidelity of the relationships in the data set and the tests used.
 Type:text
 Domain: free text
- 57 Completeness Report -- information about omissions, selection criteria, generalization, definitions used, and other rules used to derive the data set.
 Type:text
 Domain: free text

- 58 Positional Accuracy -- an assessment of the accuracy of the positions of spatial objects.
 Type:compound
- 59 Horizontal Positional Accuracy -- an estimate of accuracy of the horizontal positions
 of the spatial objects.
 Type:compound
- 60 Horizontal Positional Accuracy Report -- an explanation of the accuracy of the
 horizontal coordinate measurements and a description of the tests used.
 Type:text
 Domain: free text
- 61 Quantitative Horizontal Positional Accuracy Assessment -- numeric value
 assigned to summarize the accuracy of the horizontal coordinate measurements
 and the identification of the test that yielded the value.
 Type:compound
- 62 Horizontal Positional Accuracy Value -- an estimate of the accuracy of
 the horizontal coordinate measurements in the data set expressed in
 (ground) meters.
 Type:real
 Domain: free real
- 63 Horizontal Positional Accuracy Explanation -- the identification of the
 test that yielded the Horizontal Positional Accuracy Value.
 Type:text
 Domain: free text
- 64 Vertical Positional Accuracy -- an estimate of accuracy of the vertical positions in
 the data set.
 Type:compound
- 65 Vertical Positional Accuracy Report -- an explanation of the accuracy of the
 vertical coordinate measurements and a description of the tests used.
 Type:text
 Domain: free text
- 66 Quantitative Vertical Positional Accuracy Assessment -- numeric value
 assigned to summarize the accuracy of vertical coordinate measurements and
 the identification of the test that yielded the value.
 Type:compound
- 67 Vertical Positional Accuracy Value -- an estimate of the accuracy of the
 vertical coordinate measurement in the data set expressed in (ground)
 meters.
 Type:real
 Domain: free real
- 68 Vertical Positional Accuracy Explanation -- the identification of the test
 that yielded the Vertical Positional Accuracy Value.
 Type:text
 Domain: free text
- 69 Lineage -- information about the events, parameters, and source data which constructed the
 data set, and information about the responsible parties.
 Type:compound

- 70 Source Information -- list of sources and a short discussion of the information contributed by each.
 Type:compound
- 71 Source Citation -- reference for a source data set.
 Type:compound
- 72 Source Scale Denominator -- the denominator of the representative fraction on a map (for example, on a 1:24,000-scale map, the Source Scale Denominator is 24000).
 Type:integer
 Domain:

- Type:date
Domain: "Unknown" "Not complete" free date
- 82 Process Time -- the time when the event was completed.
Type:time
Domain: free time
- 83 Source Produced Citation Abbreviation -- the Source Citation Abbreviation of an intermediate data set that (1) is significant in the opinion of the data producer, (2) is generated in the processing step, and (3) is used in later processing steps.
Type:text
Domain: Source Citation Abbreviations from the Source Information entries for the data set.
- 84 Process Contact -- the party responsible for the processing step information.
Type:compound
- 85 Cloud Cover -- area of a data set obstructed by clouds, expressed as a percentage of the spatial extent.
Type:integer
Domain: 0 <= Cloud Cover <= 100 "Unknown"

Spatial Data Organization Information

- 86 Spatial Data Organization Information -- the mechanism used to represent spatial information in the data set.
 Type:compound

Spatial_Data_Organization_Information =
 0{Indirect_Spatial_Reference}1 +
 0{Direct_Spatial_Reference_Method +
 ([Point_and_Vector_Object_Information |
 Raster_Object_Information])}1

Point_and_Vector_Object_Information =
 [SDTS_Terms_Description |
 VPF_Terms_Description]

SDTS_Terms_Description =
 1{ SDTS_Point_and_Vector_Object_Type +
 (Point_and_Vector_Object_Count) }n

VPF_Terms_Description =
 VPF_Topology_Level +
 1{ VPF_Point_and_Vector_Object_Type +
 (Point_and_Vector_Object_Count) }n

Raster_Object_Information =
 Raster_Object_Type +
 (Row_Count +
 Column_Count +
 0{Vertical_Count}1)

- 87 Indirect Spatial Reference -- name of types of geographic features, addressing schemes, or other means through which locations are referenced in the data set.
 Type:text
 Domain: free text
- 88 Direct Spatial Reference Method -- the system of objects used to represent space in the data set.
 Type:text
 Domain: "Point" "Vector" "Raster"
- 89 Point and Vector Object Information -- the types and numbers of vector or nongrid point spatial objects in the data set.
 Type:compound
- 90 SDTS Terms Description -- point and vector object information using the terminology and concepts from "Spatial Data Concepts," which is chapter 2 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173); Washington, Department of Commerce, National Institute of Standards and Technology. *(Note that this reference to the SDTS is used ONLY to provide a set of terminology for the point and vector objects.)*
 Type:compound

- 91 SDTS Point and Vector Object Type -- name of point and vector spatial objects used to locate zero-, one-, and two-dimensional spatial locations in the data set.
Type:text
Domain: (The domain is from "Spatial Data Concepts," which is chapter 2 of part 1 in Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology):
"Point" "Entity point" "Label point" "Area point" "Node, planar graph" "Node, network" "String" "Link" "Complete chain" "Area chain" "Network chain, planar graph" "Network chain, nonplanar graph" "Circular arc, three point center" "Elliptical arc" "Uniform B-spline" "Piecewise Bezier" "Ring with mixed composition" "Ring composed of strings" "Ring composed of chains" "Ring composed of arcs" "G-polygon" "GT-polygon composed of rings" "GT-polygon composed of chains" "Universe polygon composed of rings" "Universe polygon composed of chains" "Void polygon composed of rings" "Void polygon composed of chains"
- 92 Point and Vector Object Count -- the total number of the point or vector object type occurring in the data set.
Type:integer
Domain: Point and Vector Object Count > 0
- 93 VPF Terms Description -- point and vector object information using the terminology and concepts from Department of Defense, 1992, Vector Product Format (MIL-STD-600006): Philadelphia, Department of Defense, Defense Printing Service Detachment Office. *(Note that this reference to the VPF is used ONLY to provide a set of terminology for the point and vector objects.)*
Type:compound
- 94 VPF Topology Level -- the completeness of the topology carried by the data set. The levels of completeness are defined in Department of Defense, 1992, Vector Product Format (MIL-STD-600006): Philadelphia, Department of Defense, Defense Printing Service Detachment Office.
Type:integer
Domain: $0 \leq \text{VPF Topology Level} \leq 3$
- 95 VPF Point and Vector Object Type -- name of point and vector spatial objects used to locate zero-, one-, and two-dimensional spatial locations in the data set.
Type:text
Domain: (The domain is from Department of Defense, 1992, Vector Product Format (MIL-STD-600006): Philadelphia, Department of Defense, Defense Printing Service Detachment Office):
"Node" "Edge" "Face" "Text"
- 96 Raster Object Information -- the types and numbers of raster spatial objects in the data set.

Type:compound

- 97 Raster Object Type -- raster spatial objects used to locate zero-, two-, or three-dimensional locations in the data set.
Type:text
Domain: (With the exception of "voxel", the domain is from "Spatial Data Concepts," which is chapter 2 of part 1 *in* Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology): "Point" "Pixel" "Grid Cell" "Voxel"
- 98 Row Count -- the maximum number of raster objects along the ordinate (y) axis.
For use with rectangular raster objects.
Type: Integer
Domain: Row Count > 0
- 99 Column Count -- the maximum number of raster objects along the abscissa (x) axis.
For use with rectangular raster objects.
Type: Integer
Domain: Column Count > 0
- 100 Vertical Count -- the maximum number of raster objects along the vertical (z) axis.
For use with rectangular volumetric raster objects (voxels).
Type: Integer
Domain: Depth Count > 0

Spatial Reference Information

101 Spatial Reference Information -- the description of the reference frame for, and the means to
 encode, coordinates in the data set.
 Type:compound

Spatial_Reference_Information =
 0{Horizontal_Coordinate_System_Definition}1 +
 0{Vertical_Coordinate_System_Definition}1

Horizontal_Coordinate_System_Definition =
 [Geographic |
 1{Planar}n |
 Local] +
 0{Geodetic_Model}1

Geographic =
 Latitude_Resolution +
 Longitude_Resolution +
 Geographic_Coordinate_Units

Planar =
 [Map_Projection |
 Grid_Coordinate_System |
 Local_Planar] +
 Planar_Coordinate_Information

Map_Projection =
 Map_Projection_Name +
 [Albers_Conical_Equal_Area |
 Azimuthal_Equidistant |
 Equidistant_Conic |
 Equirectangular |
 General_Vertical_Near-sided_Perspective |
 Gnomonic |
 Lambert_Azimuthal_Equal_Area |
 Lambert_Conformal_Conic |
 Mercator |
 Modified_Stereographic_for_Alaska |
 Miller_Cylindrical |
 Oblique_Mercator |
 Orthographic |
 Polar_Stereographic |
 Polyconic |
 Robinson |
 Sinusoidal |
 Space_Oblique_Mercator_(Landsat) |
 Stereographic |
 Transverse_Mercator |
 van_der_Grinten |
 Other_Projection's_Definition]

Albers_Conical_Equal_Area =
 1{Standard_Parallel}2 +
 Longitude_of_Central_Meridian +
 Latitude_of_Projection_Origin +
 False_Easting +
 False_Northing

Azimuthal_Equidistant =
 Longitude_of_Central_Meridian +
 Latitude_of_Projection_Origin +
 False_Easting +
 False_Northing

Equidistant_Conic =
 1{Standard_Parallel}2 +
 Longitude_of_Central_Meridian +
 Latitude_of_Projection_Origin +
 False_Easting +
 False_Northing

Equirectangular =
 Standard_Parallel +
 Longitude_of_Central_Meridian +
 False_Easting +
 False_Northing

General_Vertical_Near-sided_Perspective =
 Height_of_Perspective_Point_Above_Surface +
 Longitude_of_Projection_Center +
 Latitude_of_Projection_Center +
 False_Easting +
 False_Northing

Gnomonic =
 Longitude_of_Projection_Center +
 Latitude_of_Projection_Center +
 False_Easting +
 False_Northing

Lambert_Azimuthal_Equal_Area =
 Longitude_of_Projection_Center +
 Latitude_of_Projection_Center +
 False_Easting +
 False_Northing

Lambert_Conformal_Conic =
 1{Standard_Parallel}2 +
 Longitude_of_Central_Meridian +
 Latitude_of_Projection_Origin +
 False_Easting +
 False_Northing

Mercator =
 [Standard_Parallel |
 Scale_Factor_at_Equator] +
 Longitude_of_Central_Meridian +
 False_Easting +
 False_Northing

Modified_Stereographic_for_Alaska =
 False_Easting +
 False_Northing

Miller_Cylindrical =
 Longitude_of_Central_Meridian +
 False_Easting +
 False_Northing

Oblique_Mercator =
 Scale_Factor_at_Center_Line +
 [Oblique_Line_Azimuth |
 Oblique_Line_Point] +
 Latitude_of_Projection_Origin +
 False_Easting +
 False_Northing

Oblique_Line_Azimuth =
 Azimuthal_Angle +
 Azimuth_Measure_Point_Longitude

Oblique_Line_Point =
 2{Oblique_Line_Latitude +
 Oblique_Line_Longitude}2

Orthographic =
 Longitude_of_Projection_Center +
 Latitude_of_Projection_Center +
 False_Easting +
 False_Northing

Polar_Stereographic =
 Straight-Vertical_Longitude_from_Pole +
 [Standard_Parallel |
 Scale_Factor_at_Projection_Origin] +
 False_Easting +
 False_Northing

Polyconic =
 Longitude_of_Central_Meridian +
 Latitude_of_Projection_Origin +
 False_Easting +
 False_Northing

Robinson =
 Longitude_of_Projection_Center +
 False_Easting +
 False_Northing

Sinusoidal =
 Longitude_of_Central_Meridian +
 False_Easting +
 False_Northing

Space_Oblique_Mercator_(Landsat) =
 Landsat_Number +
 Path_Number +
 False_Easting +
 False_Northing

Stereographic =
 Longitude_of_Projection_Center +
 Latitude_of_Projection_Center +
 False_Easting +
 False_Northing

Transverse_Mercator =
 Scale_Factor_at_Central_Meridian +
 Longitude_of_Central_Meridian +
 Latitude_of_Projection-Origin +
 False_Easting +
 False_Northing

van_der_Grinten =
 Longitude_of_Central_Meridian +
 False_Easting +
 False_Northing

Grid_Coordinate_System =
 Grid_Coordinate_System_Name +
 [Universal_Transverse_Mercator |
 Universal_Polar_Stereographic |
 State_Plane_Coordinate_System |
 ARC_Coordinate_System |
 Other_Grid_System's_Definition]

Universal_Transverse_Mercator =
 UTM_Zone_Number +
 Transverse_Mercator

Universal_Polar_Stereographic =
 UPS_Zone_Identifier +
 Polar_Stereographic

State_Plane_Coordinate_System =
 SPCS_Zone_Identifier +
 [Lambert_Conformal_Conic |
 Transverse_Mercator |
 Oblique_Mercator |
 Polyconic]

ARC_Coordinate_System =
 ARC_System_Zone_Identifier +
 [Equirectangular |
 Azimuthal_Equidistant]

Local_Planar =
 Local_Planar_Description +
 Local_Planar_Georeference_Information

Planar_Coordinate_Information =
 Planar_Coordinate_Encoding_Method +
 [Coordinate_Representation |
 Distance_and_Bearing_Representation] +
 Planar_Distance_Units

Coordinate_Representation =
 Abscissa_Resolution +
 Ordinate_Resolution

Distance_and_Bearing_Representation =
 Distance_Resolution +
 Bearing_Resolution +
 Bearing_Units +
 Bearing_Reference_Direction +
 Bearing_Reference_Meridian

Local =
 Local_Description +
 Local_Georeference_Information

Geodetic_Model =
 0{Horizontal_Datum_Name}1 +
 Ellipsoid_Name +
 Semi-major_Axis +
 Denominator_of_Flattening_Ratio

Vertical_Coordinate_System_Definition =
 0{Altitude_System_Definition}1 +
 0{Depth_System_Definition}1

Altitude_System_Definition =
 Altitude_Datum_Name +
 1{Altitude_Resolution}n +
 Altitude_Distance_Units +
 Altitude_Encoding_Method

Depth_System_Definition =
 Depth_Datum_Name +
 1{Depth_Resolution}n +
 Depth_Distance_Units +
 Depth_Encoding_Method

102 Horizontal Coordinate System Definition -- the reference frame or system from which
 linear or angular quantities are measured and assigned to the position that a point occupies.
 Type:compound

103 Geographic -- the quantities of latitude and longitude which define the position of a
 point on the Earth's surface with respect to a reference spheroid.
 Type:compound

- 104 Latitude Resolution -- the minimum difference between two adjacent latitude values expressed in Geographic Coordinate Units of measure.
Type:real
Domain: Latitude Resolution > 0.0
- 105 Longitude Resolution -- the minimum difference between two adjacent longitude values expressed in Geographic Coordinate Units of measure.
Type:real
Domain: Longitude Resolution > 0.0
- 106 Geographic Coordinate Units -- units of measure used for the latitude and longitude values.
Type:text
Domain: "Decimal degrees" "Decimal minutes" "Decimal seconds" "Degrees and decimal minutes" "Degrees, minutes, and decimal seconds" "Radians" "Grads"
- 107 Planar -- the quantities of distances, or distances and angles, which define the position of a point on a reference plane to which the surface of the Earth has been projected.
Type:compound
- 108 Map Projection -- the systematic representation of all or part of the surface of the Earth on a plane or developable surface.
Type:compound
- 109 Map Projection Name -- name of the map projection.
Type:text
Domain: "Albers Conical Equal Area" "Azimuthal Equidistant" "Equidistant Conic" "Equirectangular" "General Vertical Near-sided Projection" "Gnomonic" "Lambert Azimuthal Equal Area" "Lambert Conformal Conic" "Mercator" "Modified Stereographic for Alaska" "Miller Cylindrical" "Oblique Mercator" "Orthographic" "Polar Stereographic" "Polyconic" "Robinson" "Sinusoidal" "Space Oblique Mercator" "Stereographic" "Transverse Mercator" "van der Grinten" "other projection"
- 110 *(map projection parameters for:)* Albers Conical Equal Area, Azimuthal Equidistant, Equidistant Conic, Equirectangular, General Vertical Near-sided Projection, Gnomonic, Lambert Azimuthal Equal Area, Lambert Conformal Conic, Mercator, Modified Stereographic for Alaska, Miller Cylindrical, Oblique Mercator, Orthographic, Polar Stereographic, Polyconic, Robinson, Sinusoidal, Space Oblique Mercator (Landsat), Stereographic, Transverse Mercator, van der Grinten³ -- parameters for a specific map projection, each having a unique mathematical relationship between the Earth and the plane or developable surface.
Type:compound
(The data elements 4.1.2.1.2.1 through 4.1.2.1.2.17 are map projection parameters. Each map projection has a specific set of defining

³-Reference information on these map projections and their parameters can be found in Synder, John, 1987, Map projections: a working manual (U.S. Geological Survey Professional Paper 1395): Washington, U.S. Government Printing Office.

parameters. These sets of parameters are provided in the syntax for each projection.)

- 111 Standard Parallel -- line of constant latitude at which the surface of the Earth and the plane or developable surface intersect.
Type:real
Domain: $-90.0 \leq \text{Standard Parallel} \leq 90.0$
- 112 Longitude of Central Meridian -- the line of longitude at the center of a map projection generally used as the basis for constructing the projection.
Type:real
Domain: $-180.0 \leq \text{Longitude of Central Meridian} < 180.0$
- 113 Latitude of Projection Origin -- latitude chosen as the origin of rectangular coordinates for a map projection.
Type:real
Domain: $-90.0 \leq \text{Latitude of Projection Origin} \leq 90.0$
- 114 False Easting -- the value added to all "x" values in the rectangular coordinates for a map projection. This value frequently is assigned to eliminate negative numbers. Expressed in the unit of measure identified in Planar Coordinate Units.
Type:real
Domain: free real
- 115 False Northing -- the value added to all "y" values in the rectangular coordinates for a map projection. This value frequently is assigned to eliminate negative numbers. Expressed in the unit of measure identified in Planar Coordinate Units.
Type:real
Domain: free real
- 116 Scale Factor at Equator -- a multiplier for reducing a distance obtained from a map by computation or scaling to the actual distance along the equator.
Type:real
Domain: $\text{Scale Factor at Equator} > 0.0$
- 117 Height of Perspective Point Above Surface -- height of viewpoint above the Earth, expressed in meters.
Type:real
Domain: $\text{Height of Perspective Point Above Surface} > 0.0$
- 118 Longitude of Projection Center -- longitude of the point of projection for azimuthal projections.
Type:real
Domain: $-180.0 \leq \text{Longitude of Projection Center} < 180.0$
- 119 Latitude of Projection Center -- latitude of the point of projection for azimuthal projections.
Type:real
Domain: $-90.0 \leq \text{Latitude of Projection Center} \leq 90.0$

- 120 Scale Factor at Center Line -- a multiplier for reducing a distance obtained from a map by computation or scaling to the actual distance along the center line.
Type:real
Domain: Scale Factor at Center Line > 0.0
- 121 Oblique Line Azimuth -- method used to describe the line along which an oblique mercator map projection is centered using the map projection origin and an azimuth.
Type:compound
- 122 Azimuthal Angle -- angle measured clockwise from north, and expressed in degrees.
Type: real
Domain: 0.0 <= Azimuthal Angle < 360.0
- 123 Azimuth Measure Point Longitude -- longitude of the map projection origin.
Type: real
Domain: -180.0 <= Azimuth Measure Point Longitude < 180.0
- 124 Oblique Line Point -- method used to describe the line along which an oblique mercator map projection is centered using two points near the limits of the mapped region that define the center line.
Type:compound
- 125 Oblique Line Latitude -- latitude of a point defining the oblique line.
Type: real
Domain: -90.0 <= Oblique Line Latitude <= 90.0
- 126 Oblique Line Longitude -- longitude of a point defining the oblique line.
Type: real
Domain: -180.0 <= Oblique Line Longitude < 180.0
- 127 Straight Vertical Longitude from Pole -- longitude to be oriented straight up from the North or South Pole.
Type:real
Domain: -180.0 <= Straight Vertical Longitude from Pole < 180.0
- 128 Scale Factor at Projection Origin -- a multiplier for reducing a distance obtained from a map by computation or scaling to the actual distance at the projection origin.
Type:real
Domain: Scale Factor at Projection Origin > 0.0

- 129 Landsat Number -- number of the Landsat satellite. (*Note: This data element exists solely to provide a parameter needed to define the space oblique mercator projection. It is not used to identify data originating from a remote sensing vehicle.*)
Type:Integer
Domain: 0 < Landsat Number < 5
- 130 Path Number -- number of the orbit of the Landsat satellite. (*Note: This data element exists solely to provide a parameter needed to define the space oblique mercator projection. It is not used to identify data originating from a remote sensing vehicle.*)
Type:integer
Domain: 0 < Path Number < 251 for Landsats 1, 2, or 3
0 < Path Number < 233 for Landsats 4 or 5
- 131 Scale Factor at Central Meridian -- a multiplier for reducing a distance obtained from a map by computation or scaling to the actual distance along the central meridian.
Type:real
Domain: Scale Factor at Central Meridian > 0.0
- 132 Other Projection's Definition -- a complete description of a projection, not defined elsewhere in this standard, that was used for the data set. The information provided shall include the name of the projection, the names of the parameters and values used for the data set, and the citation of the specification for the algorithms that describe the mathematical relationship between the Earth and the plane or developable surface for the projection.
Type:text
Domain: free text
- 133 Grid Coordinate System -- a plane-rectangular coordinate system usually based on, and mathematically adjusted to, a map projection so that geographic positions can be readily transformed to and from plane coordinates.
Type:compound
- 134 Grid Coordinate System Name -- name of the grid coordinate system.
Type:text
Domain: "Universal Transverse Mercator"
"Universal Polar Stereographic"
"State Plane Coordinate System 1927"
"State Plane Coordinate System 1983"
"ARC Coordinate System" "other grid system"
- 135 Universal Transverse Mercator (UTM) -- a grid system based on the transverse mercator projection, applied between latitudes 84 degrees north and 80 degrees south on the Earth's surface.
Type:compound
- 136 UTM Zone Number -- identifier for the UTM zone.
Type: integer
Domain: 1 <= UTM Zone Number <= 60 for the northern hemisphere;
-60 <= UTM Zone Number <= -1 for the southern hemisphere

- 137 Universal Polar Stereographic (UPS) -- a grid system based on the polar stereographic projection, applied to the Earth's polar regions north of 84 degrees north and south of 80 degrees south.
Type:compound
- 138 UPS Zone Identifier -- identifier for the UPS zone.
Type:text
Domain: "A" "B" "Y" "Z"
- 139 State Plane Coordinate System (SPSC) -- a plane-rectangular coordinate system established for each state in the United States by the National Geodetic Survey.
Type:compound
- 140 SPCS Zone Identifier -- identifier for the SPCS zone.
Type:text
Domain: Four-digit numeric codes for the State Plane Coordinate Systems based on the North American Datum of 1927 are found in Department of Commerce, 1986, Representation of geographic point locations for information interchange (Federal Information Processing Standard 70-1): Washington: Department of Commerce, National Institute of Standards and Technology. Codes for the State Plane Coordinate Systems based on the North American Datum of 1983 are found in Department of Commerce, 1989 (January), State Plane Coordinate System of 1983 (National Oceanic and Atmospheric Administration Manual NOS NGS 5): Silver Spring, Maryland, National Oceanic and Atmospheric Administration, National Ocean Service, Coast and Geodetic Survey.
- 141 ARC Coordinate System -- the Equal Arc-second Coordinate System, a plane-rectangular coordinate system established in Department of Defense, 1990, Military specification ARC Digitized Raster Graphics (ADRG) (MIL-A-89007): Philadelphia, Department of Defense, Defense Printing Service Detachment Office.

Type:compound
- 142 ARC System Zone Identifier -- identifier for the ARC Coordinate System Zone.
Type:integer
Domain: 1 <= ARC System Zone Identifier <= 18

| | |
|-----|---|
| 143 | <p>Other Grid System's Definition -- a complete description of a grid system, not defined elsewhere in this standard, that was used for the data set. The information provided shall include the name of the grid system, the names of the parameters and values used for the data set, and the citation of the specification for the algorithms that describe the mathematical relationship between the Earth and the coordinates of the grid system.</p> <p>Type:text Domain: free text</p> |
| 144 | <p>Local Planar -- any right-handed planar coordinate system of which the z-axis coincides with a plumb line through the origin that locally is aligned with the surface of the Earth.</p> <p>Type:compound</p> |
| 145 | <p>Local Planar Description -- a description of the local planar system.</p> <p>Type:text Domain: free text</p> |
| 146 | <p>Local Planar Georeference Information -- a description of the information provided to register the local planar system to the Earth (e.g. control points, satellite ephemeral data, inertial navigation data).</p> <p>Type:text Domain: free text</p> |
| 147 | <p>Planar Coordinate Information -- information about the coordinate system developed on the planar surface.</p> <p>Type:compound</p> |
| 148 | <p>Planar Coordinate Encoding Method -- the means used to represent horizontal positions.</p> <p>Type:text Domain: "coordinate pair" "distance and bearing" "row and column"</p> |
| 149 | <p>Coordinate Representation -- the method of encoding the position of a point by measuring its distance from perpendicular reference axes (the "coordinate pair" and "row and column" methods).</p> <p>Type:compound</p> |
| 150 | <p>Abscissa Resolution -- the (nominal) minimum distance between the "x" or column values of two adjacent points, expressed in Planar Distance Units of measure.</p> <p>Type:real Domain: Abscissa Resolution > 0.0</p> |
| 151 | <p>Ordinate Resolution -- the (nominal) minimum distance between the "y" or row values of two adjacent points, expressed in Planar Distance Units of measure.</p> <p>Type:real Domain: Ordinate Resolution > 0.0</p> |
| 152 | <p>Distance and Bearing Representation -- a method of encoding the position of a point by measuring its distance and direction (azimuth angle) from another point.</p> <p>Type:compound</p> |

- 153 Distance Resolution -- the minimum distance measurable between two points, expressed Planar Distance Units of measure.
Type:real
Domain: Distance Resolution > 0.0
- 154 Bearing Resolution -- the minimum angle measurable between two points, expressed in Bearing Units of measure.
Type:real
Domain: Bearing Resolution > 0.0
- 155 Bearing Units -- units of measure used for angles.
Type:text
Domain: "Decimal degrees" "Decimal minutes" "Decimal seconds" "Degrees and decimal minutes" "Degrees, minutes, and decimal seconds" "Radians" "Grads"
- 156 Bearing Reference Direction -- direction from which the bearing is measured.
Type:text
Domain: "North" "South"
- 157 Bearing Reference Meridian -- axis from which the bearing is measured.
Type:text
Domain: "Assumed" "Grid" "Magnetic" "Astronomic" "Geodetic"
- 158 Planar Distance Units -- units of measure used for distances.
Type:text
Domain: "meters" "international feet" "survey feet" free text
- 159 Local -- a description of any coordinate system that is not aligned with the surface of the Earth.
Type:compound
- 160 Local Description -- a description of the coordinate system and its orientation to the surface of the Earth.
Type:text
Domain: free text
- 161 Local Georeference Information -- a description of the information provided to register the local system to the Earth (e.g. control points, satellite ephemeral data, inertial navigation data).
Type:text
Domain: free text
- 162 Geodetic Model -- parameters for the shape of the earth.
Type:compound
- 163 Horizontal Datum Name -- the identification given to the reference system used for defining the coordinates of points.
Type: text
Domain: "North American Datum of 1927" "North American Datum of 1983" free text

| | |
|-----|--|
| 164 | <p>Ellipsoid Name -- identification given to established representations of the Earth's shape.</p> <p>Type:text</p> <p>Domain: "Clarke 1866" "Geodetic Reference System 80" free text</p> |
| 165 | <p>Semi-major Axis -- radius of the equatorial axis of the ellipsoid.</p> <p>Type:real</p> <p>Domain: Semi-major Axis > 0.0</p> |
| 166 | <p>Denominator of Flattening Ratio -- the denominator of the ratio of the difference between the equatorial and polar radii of the ellipsoid when the numerator is set to 1.</p> <p>Type:real</p> <p>Domain: Denominator of Flattening > 0.0</p> |
| 167 | <p>Vertical Coordinate System Definition -- the reference frame or system from which vertical distances (altitudes or depths) are measured.</p> <p>Type:compound</p> |
| 168 | <p>Altitude System Definition -- the reference frame or system from which altitudes (elevations) are measured. The term "altitude" is used instead of the common term "elevation" to conform to the terminology in Federal Information Processing Standards 70-1 and 173.</p> <p>Type:compound</p> |
| 169 | <p>Altitude Datum Name -- the identification given to the level surface taken as the surface of reference from which altitudes are measured.</p> <p>Type: text</p> <p>Domain: "National Geodetic Vertical Datum of 1929" "North American Vertical Datum of 1988" free text</p> |
| 170 | <p>Altitude Resolution -- the minimum distance possible between two adjacent altitude values, expressed in Altitude Distance Units of measure.</p> <p>Type:real</p> <p>Domain: Altitude Resolution > 0.0</p> |
| 171 | <p>Altitude Distance Units -- units in which altitudes are recorded.</p> <p>Type:text</p> <p>Domain: "meters" "feet" free text</p> |
| 172 | <p>Altitude Encoding Method -- the means used to encode the altitudes.</p> <p>Type:text</p> <p>Domain: "Explicit elevation coordinate included with horizontal coordinates" "Implicit coordinate" "Attribute values"</p> |
| 173 | <p>Depth System Definition -- the reference frame or system from which depths are measured.</p> <p>Type:compound</p> |
| 174 | <p>Depth Datum Name -- the identification given to surface of reference from which depths are measured.</p> <p>Type: text</p> <p>Domain: "Local surface" "Chart datum; datum for sounding reduction" "Lowest astronomical tide" "Highest astronomical tide" "Mean low water" "Mean high</p> |

water" "Mean sea level" "Land survey datum"
 "Mean low water springs" "Mean high water springs"
 "Mean low water neap" "Mean high water neap"
 "Mean lower low water" "Mean lower low water springs"
 "Mean higher high water" "Mean higher low water"
 "Mean lower high water" "Spring tide" "Tropic lower low
 water" "Neap tide" "High water" "Higher high water"
 "Low water" "Low-water datum" "Lowest low water"
 "Lower low water" "Lowest normal low water" "Mean tide
 level" "Indian spring low water"
 "High-water full and charge" "Low-water full and charge"
 "Columbia River datum" "Gulf Coast low water datum"
 "Equatorial springs low water" "Approximate lowest
 astronomical tide" "No correction" free text

- 175 Depth Resolution -- the minimum distance possible between two adjacent
 depth values, expressed in Depth Distance Units of measure.
 Type:real
 Domain: Depth Resolution > 0.0
- 176 Depth Distance Units -- units in which depths are recorded.
 Type:text
 Domain: "meters" "feet" free text
- 177 Depth Encoding Method -- the means used to encode depths.
 Type:text
 Domain: "Explicit depth coordinate included with horizontal
 coordinates" "Implicit coordinate" "Attribute values"

178 Entity and Attribute Information -- information about the information content of the data set, including the entities types, their attributes, and the domains from which attribute values may be assigned.

Type:compound

Entity_and_Attribute_Information =

[Detailed_Description |
Overview_Description |
Detailed_Description +
Overview_Description]

Detailed_Description =

1{Entity_Type +
0{Attribute}n }n

Entity_Type =

Entity_Type_Label +
Entity_Type_Definition +
Entity_Type_Definition_Source

Attribute =

Attribute_Label +
Attribute_Definition +
Attribute_Definition_Source
1{Attribute_Domain_Values}n +
0{Attribute_Units_of_Measure}1 +
(Attribute_Measurement_Resolution) +
(1{Beginning_Date_of_Attribute_Values +
0{Ending_Date_of_Attribute_Values}1 }n) +
(Attribute_Value_Accuracy_Information) +
(Attribute_Measurement_Frequency)

Attribute_Domain_Values =

[Enumerated_Domain |
Range_Domain |
Codeset_Domain |
Unrepresentable_Domain]

Enumerated_Domain =

1{Enumerated_Domain_Value +
Enumerated_Domain_Value_Definition +
Enumerated_Domain_Value_Definition_Source +
0{Attribute}n }n

Range_Domain =

Range_Domain_Minimum +
Range_Domain_Maximum +
0{Attribute}n

Codeset_Domain=

Codeset_Name +
Codeset_Source

Attribute_Value_Accuracy_Information =
 Attribute_Value_Accuracy +
 Attribute_Value_Accuracy_Explanation

Overview_Description =
 1{Entity_and_Attribute_Overview +
 1{Entity_and_Attribute_Detail_Citation}n }n

179 Detailed Description -- description of the entities, attributes, attribute values, and related characteristics encoded in the data set.
 Type:compound

180 Entity Type -- the definition and description of a set into which similar entity instances are classified.
 Type:compound

181 Entity Type Label -- the name of the entity type.
 Type:text
 Domain: free text

182 Entity Type Definition -- the description of the entity type.
 Type:text
 Domain: free text

183 Entity Type Definition Source -- the authority of the definition.
 Type:text
 Domain: free text

184 Attribute -- a defined characteristic of an entity.
 Type:compound

185 Attribute Label -- the name of the attribute.
 Type:text
 Domain: free text

186 Attribute Definition -- the description of the attribute.
 Type:text
 Domain: free text

187 Attribute Definition Source -- the authority of the definition.
 Type:text
 Domain: free text

188 Attribute Domain Values -- the valid values that can be assigned for an attribute.
 Type:compound

189 Enumerated Domain -- the members of an established set of valid values.
 Type:compound

190 Enumerated Domain Value -- the name or label of a member of the set.
 Type:text
 Domain: free text

| | |
|-----|---|
| 191 | Enumerated Domain Value Definition -- the description of the value. Type:text Domain: free text |
| 192 | Enumerated Domain Value Definition Source -- the authority of the definition. Type:text Domain: free text |
| 193 | Range Domain -- the minimum and maximum values of a continuum of valid values. Type:compound |
| 194 | Range Domain Minimum -- the least value that the attribute can be assigned. Type:text Domain: free text |
| 195 | Range Domain Maximum -- the greatest value that the attribute can be assigned. Type:text Domain: free text |
| 196 | Codeset Domain -- reference to a standard or list which contains the members of an established set of valid values. Type:compound |
| 197 | Codeset Name -- the title of the codeset. Type:text Domain: free text |
| 198 | Codeset Source -- the authority for the codeset. Type:text Domain: free text |
| 199 | Unrepresentable Domain -- description of the values and reasons why they cannot be represented. Type:text Domain: free text |
| 200 | Attribute Units of Measurement -- the standard of measurement for an attribute value. Type:text Domain: free text |
| 201 | Attribute Measurement Resolution -- the smallest unit increment to which an attribute value is measured. Type:real Domain: Attribute Measurement Resolution > 0.0 |
| 202 | Beginning Date of Attribute Values -- earliest or only date for which the attribute values are current. In cases when a range of dates are provided, this is the earliest date for which the information are valid. Type:date Domain: free date |

| | |
|-----|--|
| 203 | Ending Date of Attribute Values -- latest date for which the information are current. Used in cases when a range of dates are provided. Type:date Domain: free date |
| 204 | Attribute Value Accuracy Information -- an assessment of the accuracy of the assignment of attribute values. Type:compound |
| 205 | Attribute Value Accuracy -- an estimate of the accuracy of the assignment of attribute values. Type:real Domain: free real |
| 206 | Attribute Value Accuracy Explanation -- the definition of the Attribute Value Accuracy measure and units, and a description of how the estimate was derived. Type:text Domain: free text |
| 207 | Attribute Measurement Frequency -- the frequency with which attribute values are added. Type:real Domain: "Unknown" "As needed" "Irregular" "None planned" free text |
| 208 | Overview Description -- summary of, and citation to detailed description of, the information content of the data set. Type:compound |
| 209 | Entity and Attribute Overview -- detailed summary of the information contained in a data set. Type:text Domain: free text |
| 210 | Entity and Attribute Detail Citation -- reference to the complete description of the entity types, attributes, and attribute values for the data set. Type:text Domain: free text |

211 Distribution Information -- information about the distributor of and options for obtaining the data set.

Type:compound

Distribution_Information =

1{Distributor +
 0{Resource_Description}1 +
 Distribution_Liability +
 0{Standard_Order_Process}n +
 0{Custom_Order_Process}1 +
 (Technical_Prerequisites) +
 (Available_Time_Period) }n

Distributor =

Contact_Information *(see section 10 for production rules)*

Standard_Order_Process =

[Non-digital_Form |
 1{Digital_Form}n] +
 Fees +
 (Ordering_Instructions) +
 (Turnaround)

Digital_Form =

Digital_Transfer_Information +
 Digital_Transfer_Option

Digital_Transfer_Information =

Format_Name +
 ([Format_Version_Number |
 Format_Version_Date] +
 (Format_Specification)) +
 (Format_Information_Content) +
 0{File-Decompression_Technique}1 +
 (Transfer_Size)

Digital_Transfer_Option =

1{ [Online_Option |
 Offline_Option] }n

Online_Option =

1{Computer_Contact_Information}n +
 (Access_Instructions) +
 (Online_Computer_and_Operating_System)

Computer_Contact_Information =

[Network_Address |
 Dialup_Instructions]

Network_Address =

1{Network_Resource_Name}n

Dialup_Instructions =
 Lowest_BPS +
 0{Highest_BPS}1 +
 Number_DataBits +
 Number_StopBits +
 Parity +
 0{Compression_Support}1 +
 1{Dialup_Telephone}n +
 1{Dialup_File_Name}n

Offline_Option =
 Offline_Media +
 0{Recording_Capacity}1
 1{Recording_Format}n +
 0{Compatibility_Information}1

Recording_Capacity =
 1{Recording_Density}n +
 Recording_Density_Units

Available_Time_Period =
 Time_Period_Information (*see section 9 for production rules*)

- 212 Distributor -- the party from whom the data set may be obtained.
 Type:compound
- 213 Resource Description -- the identifier by which the distributor knows the data set.
 Type:text
 Domain: free text
- 214 Distribution Liability -- statement of the liability assumed by the distributor.
 Type:text
 Domain: free text
- 215 Standard Order Process -- the common ways in which the data set may be obtained or
 received, and related instructions and fee information.
 Type:compound
- 216 Non-digital Form -- the description of options for obtaining the data set on non-
 computer-compatible media.
 Type:text
 Domain: free text
- 217 Digital Form -- the description of options for obtaining the data set on computer-
 compatible media.
 Type:compound
- 218 Digital Transfer Information - description of the form of the data to be
 distributed.
 Type:compound

Format Name -- the name of the data transfer format.

Type:text

Domain: domain values from the table below; free text

| Domain Value | Definition |
|-----------------|---|
| "ARCE" | ARC/INFO Export format |
| "ARCG" | ARC/INFO Generate format |
| "ASCII" | ASCII file, formatted for text attributes, declared format |
| "BIL" | Imagery, band interleaved by line |
| "BIP" | Imagery, band interleaved by pixel |
| "BSQ" | Imagery, band interleaved sequential |
| "CDF" | Common Data Format |
| "CFF" | Cartographic Feature File (U.S. Forest Service) |
| "COORD" | User-created coordinate file, declared format |
| "DEM" | Digital Elevation Model format (U.S. Geological Survey) |
| "DFAD" | Digital Feature Analysis Data (Defense Mapping Agency) |
| "DGN" | Microstation format (Intergraph Corporation) |
| "DIGEST" | Digital Geographic Information Exchange Standard |
| "DLG" | Digital Line Graph (U.S. Geological Survey) |
| "DTED" | Digital Terrain Elevation Data (MIL-D- 89020) |
| "DWG" | AutoCAD Drawing format |
| "DX90" | Data Exchange '90 |
| "DXF" | AutoCAD Drawing Exchange Format |
| "ERDAS" | ERDAS image files (ERDAS Corporation) |
| "GRASS" | Geographic Resources Analysis Support System |
| "HDF" | Hierarchical Data Format |
| "IGDS" | Interactive Graphic Design System format (Intergraph Corporation) |
| "IGES" | Initial Graphics Exchange Standard |
| "MOSS" | Multiple Overlay Statistical System export file |
| "netCDF" | network Common Data Format |
| "NITF" | National Imagery Transfer Format |
| "RPF" | Raster Product Format (Defense Mapping Agency) |
| "RVC" | Raster Vector Converted format (MicroImages) |
| "RVF" | Raster Vector Format (MicroImages) |
| "SDTS" | Spatial Data Transfer Standard (Federal Information Processing Standard 173) |
| "SIF" | Standard Interchange Format (DOD Project 2851) |
| "SLF" | Standard Linear Format (Defense Mapping Agency) |
| "TIFF" | Tagged Image File Format |

"TGRN" Topologically Integrated Geographic Encoding
and Referencing (TIGER) Line format (Bureau of
the Census)
"VPF" Vector Product Format (Defense Mapping
Agency)

- 220 Format Version Number -- version number of the format.
Type:text
Domain: free text
- 221 Format Version Date -- date of the version of the format.
Type:date
Domain: free date
- 222 Format Specification -- name of a subset, profile, or product
specification of the format.
Type:text
Domain: free text
- 223 Format Information Content -- description of the content of the data
encoded in a format.
Type:text
Domain: free text
- 224 File Decompression Technique -- recommendations of algorithms or
processes (including means of obtaining these algorithms or processes)
that can be applied to read or expand data sets to which data compression
techniques have been applied.
Type:text
Domain: "No compression applied" free text
- 225 Transfer Size -- the size, or estimated size, of the transferred data set in
megabytes.
Type:real
Domain: Transfer Size > 0.0
- 226 Digital Transfer Option -- the means and media by which a data set is obtained
from the distributor.
Type:compound
- 227 Online Option -- information required to directly obtain the data set
electronically.
Type:compound
- 228 Computer Contact Information -- instructions for establishing
communications with the distribution computer.
Type:compound
- 229 Network Address -- the electronic address from which the
data set can be obtained from the distribution computer.
Type: compound
- 230 Network Resource Name -- the name of the file or
service from which the data set can be obtained.
Type:text
Domain: free text

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| 231 | Dialup Instructions -- information required to access the distribution computer remotely through telephone lines. Type: compound |
| 232 | Lowest BPS -- lowest or only speed for the connection's communication, expressed in bits per second. Type: integer Domain: Lowest BPS >= 110 |
| 233 | Highest BPS -- highest speed for the connection's communication, expressed in bits per second. Used in cases when a range of rates are provided. Type: integer Domain: Highest BPS > Lowest BPS |
| 234 | Number DataBits -- number of data bits in each character exchanged in the communication. Type: integer Domain: 7 <= Number DataBits <= 8 |
| 235 | Number StopBits -- number of stop bits in each character exchanged in the communication. Type: integer Domain: 1 <= Number StopBits <= 2 |
| 236 | Parity -- parity error checking used in each character exchanged in the communication. Type: text Domain: "None" "Odd" "Even" "Mark" "Space" |
| 237 | Compression Support -- data compression available through the modem service to speed data transfer. Type: text Domain: "V.32" "V.32bis" "V.42" "V.42bis" free text |
| 238 | Dialup Telephone -- the telephone number of the distribution computer. Type: text Domain: free text |
| 239 | Dialup File Name -- the name of a file containing the data set on the distribution computer. Type: text Domain: free text |
| 240 | Access Instructions -- instructions on the steps required to access the data set. Type: text Domain: free text |
| 241 | Online Computer and Operating System -- the brand of distribution computer and its operating system. |

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| | Type:text Domain: free text |
| 242 | Offline Option -- information about media-specific options for receiving the data set. Type:compound |
| 243 | Offline Media -- name of the media on which the data set can be received. Type:text Domain: "CD-ROM" "3-1/2 inch floppy disk" "5-1/4 inch floppy disk" "9-track tape" "4 mm cartridge tape" "8 mm cartridge tape" "1/4-inch cartridge tape" free text |
| 244 | Recording Capacity -- the density of information to which data are written. Used in cases where different recording capacities are possible. Type:compound |
| 245 | Recording Density -- the density in which the data set can be recorded. Type: real Domain: Recording Density > 0.0 |
| 246 | Recording Density Units -- the units of measure for the recording density. Type: text Domain: free text |
| 247 | Recording Format -- the options available or method used to write the data set to the medium. Type:text Domain: "cpio" "tar" "High Sierra" "ISO 9660" "ISO 9660 with Rock Ridge extensions" "ISO 9660 with Apple HFS extensions" free text |
| 248 | Compatibility Information --- description of other limitations or requirements for using the medium. Type:text Domain: free text |
| 249 | Fees -- the fees and terms for retrieving the data set. Type:text Domain: free text |
| 250 | Ordering Instructions -- general instructions and advice about, and special terms and services provided for, the data set by the distributor. Type:text Domain: free text |
| 251 | Turnaround -- typical turnaround time for the filling of an order. Type:text Domain: free text |

- 252 Custom Order Process -- description of custom distribution services available, and the terms and conditions for obtaining these services.
Type:text
Domain: free text
- 253 Technical Prerequisites -- description of any technical capabilities that the consumer must have to use the data set in the form(s) provided by the distributor.
Type:text
Domain: free text
- 254 Available Time Period -- the time period when the data set will be available from the distributor.
Type:compound

Metadata Reference Information

- 255 Metadata Reference Information -- information on the currentness of the metadata information, and the responsible party.
 Type:compound

Metadata_Reference_Information =
 Metadata_Date +
 (Metadata_Review_Date +
 (Metadata_Future_Review_Date)) +
 Metadata_Contact +
 Metadata_Standard_Name +
 Metadata_Standard_Version +
 0{Metadata_Time_Convention}1 +
 (Metadata_Access_Constraints) +
 (Metadata_Use_Constraints) +
 (Metadata_Security_Information)

Metadata_Contact =
 Contact_Information *(see section 10 for production rules)*

Metadata_Security_Information =
 Metadata_Security_Classification_System +
 Metadata_Security_Classification +
 Metadata_Security_Handling_Description

- 256 Metadata Date -- the date that the metadata were created or last updated.
 Type:date
 Domain: free date
- 257 Metadata Review Date -- the date of the latest review of the metadata entry.
 Type:date
 Domain: free date; Metadata Review Date later than Metadata Date
- 258 Metadata Future Review Date -- the date by which the metadata entry should be reviewed.
 Type:date
 Domain: free date; Metadata Future Review Date later than Metadata Review Date
- 259 Metadata Contact -- the party responsible for the metadata information.
 Type:compound
- 260 Metadata Standard Name -- the name of the metadata standard used to document the data set.
 Type:text
 Domain: "FGDC Content Standards for Digital Geospatial Metadata" free text
- 261 Metadata Standard Version -- identification of the version of the metadata standard used to document the data set.
 Type:text
 Domain: free text
- 262 Metadata Time Convention -- form used to convey time of day information in the metadata entry. Used if time of day information is included in the metadata for a data set.
 Type:text
 Domain: "local time" "local time with time differential factor" "universal time"

- 263 Metadata Access Constraints -- restrictions and legal prerequisites for accessing the metadata. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the metadata.
 Type:text
 Domain: free text
- 264 Metadata Use Constraints -- restrictions and legal prerequisites for using the metadata after access is granted. These include any access constraints applied to assure the protection of privacy or intellectual property, and any special restrictions or limitations on obtaining the metadata.
 Type:text
 Domain: free text
- 265 Metadata Security Information -- handling restrictions imposed on the metadata because of national security, privacy, or other concerns.
 Type:compound
- 266 Metadata Security Classification System -- name of the classification system for the metadata.
 Type:text
 Domain: free text
- 267 Metadata Security Classification -- name of the handling restrictions on the metadata.
 Type:text
 Domain: "Top secret" "Secret" "Confidential" "Restricted" "Unclassified"
 "Sensitive" free text
- 268 Metadata Security Handling Description -- additional information about the restrictions on handling the metadata.
 Type:text
 Domain: free text

Citation Information

- 269 Citation Information -- the recommended reference to be used for the data set. (*Note: this section provides a means of stating the citation of a data set, and is used by other sections of the metadata standard. This section is never used alone.*)
 Type:compound

Citation_Information =
 1{Originator}n +
 Publication_Date +
 (Publication_Time) +
 Title +
 0{Edition}1 +
 0{Geospatial_Data_Presentation_Form}1 +
 0{Series_Information}1 +
 0{Publication_Information}1 +
 0{Other_Citation_Details}1 +
 (1{Online_Linkage}n) +
 0{Larger_Work_Citation}1

Series_Information =
 Series_Name +
 Issue_Identification

Publication_Information =
 Publication_Place +
 Publisher

Larger_Work_Citation =
 Citation_Information

- 270 Originator -- the name of an organization or individual that developed the data set. If the name of editors or compilers are provided, the name must be followed by "(ed.)" or "(comp.)" respectively.
 Type:text
 Domain: "Unknown" free text
- 271 Publication Date -- the date when the data set is published or otherwise made available for release.
 Type:date
 Domain: "Unknown" "Unpublished material" free date
- 272 Publication Time -- the time of day when the data set is published or otherwise made available for release.
 Type:time
 Domain: "Unknown" free time
- 273 Title -- the name by which the data set is known.
 Type:text
 Domain: free text

- 274 Edition -- the version of the title.
 Type:text
 Domain: free text
- 275 Geospatial Data Presentation Form -- the mode in which the geospatial data is represented.
 Type:text
 Domain: (the domain is from pp. 88-91 *in* Anglo-American Committee on
 Cataloguing of Cartographic Materials, 1982, Cartographic materials:
 A manual of interpretation for AACR2: Chicago, American Library
 Association):
 "atlas" "diagram" "globe" "map" "model" "profile"
 "remote-sensing image" "section" "view"
- 276 Series Information -- the identification of the series publication of which the data set is a
 part.
 Type:compound
- 277 Series Name -- the name of the series publication of which the data set is a part.
 Type:text
 Domain: free text
- 278 Issue Identification -- information identifying the issue of the series publication of
 which the data set is a part.
 Type:text
 Domain: free text
- 279 Publication Information -- publication details for published data sets.
 Type:compound
- 280 Publication Place -- the name of the city (and state or province, and country, if
 needed to identify the city) where the data set was published or released.
 Type:text
 Domain: free text
- 281 Publisher -- the name of the individual or organization that published the data set.
 Type:text
 Domain: free text
- 282 Other Citation Details -- other information required to complete the citation.
 Type:text
 Domain: free text
- 283 Online Linkage -- the name of an online computer resource that contains the data set.
 Entries should follow the Uniform Resource Locator convention of the Internet.
 Type:text
 Domain: free text
- 284 Larger Work Citation -- the information identifying a larger work in which the data set is
 included.
 Type:compound

Time Period Information

285 Time Period Information -- information about the date and time of an event. *(Note: this section provides a means of stating temporal information, and is used by other sections of the metadata standard. This section is never used alone.)*

 Type:compound

Time_Period_Information =

[Single_Date/Time |
Multiple_Dates/Times |
Range_of_Dates/Times]

Single_Date/Time =

Calendar_Date +
(Time_of_Day)

Multiple_Dates/Times =

2{Calendar_Date +
(Time_of_Day) }n

Range_of_Dates/Times =

Beginning_Date +
(Beginning_Time) +
Ending_Date +
(Ending_Time)

286 Single Date/Time -- means of encoding a single date and time.

 Type:compound

287 Calendar Date -- the year (and optionally month, or month and day).

 Type:date

 Domain: "Unknown" free date

288 Time of Day -- the hour (and optionally minute, or minute and second) of the day.

 Type:time

 Domain: "Unknown" free time

289 Multiple Dates/Times -- means of encoding multiple individual dates and times.

 Type:compound

290 Range of Dates/Times -- means of encoding a range of dates and times.

 Type:compound

291 Beginning Date -- the first year (and optionally month, or month and day) of the event.

 Type:date

 Domain: "Unknown" free date

292 Beginning Time -- the first hour (and optionally minute, or minute and second) of the day for the event.

 Type:time

 Domain: "Unknown" free time

- 293 Ending Date -- the last year (and optionally month, or month and day) for the event.
 Type:date
 Domain: "Unknown" "Present" free date
- 294 Ending Time -- the last hour (and optionally minute, or minute and second) of the
 day for the event.
 Type:time
 Domain: "Unknown" free time

Contact Information

295 Contact Information -- Identity of, and means to communicate with, person(s) and organization(s) associated with the data set. *(Note: this section provides a means of identifying individuals and organizations, and is used by other sections of the metadata standard. This section is never used alone.)*

Type:compound

Contact_Information =

[Contact_Person_Primary |
 Contact_Organization_Primary] +
 (Contact_Position) +
 1{Contact_Address}n +
 1{Contact_Voice_Telephone}n +
 (1{Contact_TDD/TTY_Telephone}n) +
 (1{Contact_Facsimile_Telephone}n) +
 (1{Contact_Electronic_Mail_Address}n) +
 (Hours_of_Service) +
 (Contact_Instructions)

Contact_Person_Primary =

Contact_Person +
 (Contact_Organization)

Contact_Organization_Primary =

Contact_Organization +
 (Contact_Person)

Contact_Address =

Address_Type +
 0{Address}n +
 City +
 State_or_Province +
 Postal_Code +
 (Country)

296 Contact Person Primary -- the person, and the affiliation of the person, associated with the data set. Used in cases where the association of the person to the data set is more significant than the association of the organization to the data set.

Type:compound

297 Contact Person -- the name of the individual to which the contact type applies.

Type:text

Domain: free text

298 Contact Organization -- the name of the organization to which the contact type applies.

Type:text

Domain: free text

299 Contact Organization Primary -- the organization, and the member of the organization, associated with the data set. Used in cases where the association of the organization to the data set is more significant than the association of the person to the data set.

Type:compound

300 Contact Position -- the title of individual.

| | |
|-----|---|
| | Type:text Domain: free text |
| 301 | Contact Address -- the address for the organization or individual. Type:compound |
| 302 | Address Type -- the information provided by the address. Type:text Domain: "mailing address" "physical address" "mailing and physical address" |
| 303 | Address -- an address line for the address. Type:text Domain: free text |
| 304 | City -- the city of the address. Type:text Domain: free text |
| 305 | State or Province -- the state or province of the address. Type:text Domain: free text |
| 306 | Postal Code -- the ZIP or other postal code of the address. Type:text Domain: free text |
| 307 | Country -- the country of the address. Type:text Domain: free text |
| 308 | Contact Voice Telephone -- the telephone number by which individuals can speak to the organization or individual. Type:text Domain: free text |
| 309 | Contact TDD/TTY Telephone -- the telephone number by which hearing-impaired individuals can contact the organization or individual. Type:text Domain: free text |
| 310 | Contact Facsimile Telephone -- the telephone number of a facsimile machine of the organization or individual. Type:text Domain: free text |
| 311 | Contact Electronic Mail Address -- the address of the electronic mailbox of the organization or individual. Type:text Domain: free text |
| 312 | Hours of Service -- time period when individuals can speak to the organization or individual. Type:text Domain: free text |

Contact Instructions -- supplemental instructions on how or when to contact the individual or organization.

Type:text

Domain: free text

Glossary

[Most of the terms and definitions are from Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington: Department of Commerce, National Institute of Standards and Technology.]

abscissa -- the coordinate of a point in a plane cartesian coordinate system obtained by measuring parallel to the x-axis ("the 'x' value").

accuracy -- the closeness of results of observations, computations or estimates to the true values or the values accepted as being true.

altitude -- elevation above or below a reference datum, as defined in Federal Information Processing Standard 70-1. See also elevation.

area -- a generic term for a bounded, continuous, two-dimensional object that may or may not include its boundary.

area chain -- a chain that explicitly references left and right polygons and not start and end nodes. It is a component of a two-dimensional manifold.

area point -- a representative point within an area usually carrying attribute information about that area.

arc -- a locus of points that forms a curve that is defined by a mathematical expression.

attribute -- a defined characteristic of an entity type (e.g. composition).

attribute value -- a specific quality or quantity assigned to an attribute (e.g., steel), for a specific entity instance.

chain -- a directed nonbranching sequence of nonintersecting line segments and (or) arcs bounded by nodes, not necessarily distinct, at each end. Area chain, complete chain, and network chain are special cases of chain, and share all characteristics of the general case as defined above.

clearinghouse -- see National Geospatial Data Clearinghouse.

complete chain -- a chain that explicitly references left and right polygons and start and end nodes. It is a component of a two-dimensional manifold.

compound element -- a group of data elements and other compound elements. Compound elements represent higher-level concepts that cannot be represented by individual data elements.

coordinates -- pairs of numbers expressing horizontal distances along orthogonal axes; alternatively, triplets of numbers measuring horizontal and vertical distances.

data element -- a logically primitive item of data.

data set -- a collection of related data.

depth -- perpendicular distance of an interior point from the surface of an object.

developable surface -- a surface that can be flattened to form a plane without compressing or stretching any part of it. Examples include cones and cylinders.

digital image -- a two-dimensional array of regularly spaced picture elements (pixels) constituting a picture.

digital volume -- a three-dimensional array of regularly spaced volume elements (voxels) constituting a volume.

domain -- in the definition of the elements in the metadata standard, the domain identifies valid values for a data element.

Edge, Topology Level 0 -- VPF term for a string.

Edge, Topology Level 1 -- VPF term for a network chain in a network (in SDTS, a "Network chain, non-planar graph").

Edge, Topology Level 2 -- VPF term for a network chain in a planar graph (in SDTS, a "Network chain, planar graph").

Edge, Topology Level 3 -- VPF term for a complete chain.

elevation -- conforming to Federal Information Processing Standard 70-1, the term "altitude" is used in this standard, rather than the common term elevation.

entity instance -- a spatial phenomenon of a defined type that is embedded in one or more phenomena of different type, or that has at least one key attribute value different from the corresponding attribute values of surrounding phenomena (e.g., the 10 Street Bridge).

entity point -- a point used for identifying the location of point features (or areal features collapsed to a point), such as towers, buoys, buildings, places, etc.

entity type -- the definition and description of a set into which similar entity instances are classified (e.g., bridge).

explicit -- method of identifying positions directly by pairs (for horizontal positions) or triplets (for horizontal and vertical positions) of numbers.

Face, Topology Level 3 -- VPF term for a GT-polygon composed of rings.

G-polygon -- an area consisting of an interior area, one outer G-ring and zero or more nonintersecting, nonnested inner G-rings. No ring, inner or outer, shall be collinear with or intersect any other ring of the same G-polygon.

G-ring -- a ring created from strings and (or) arcs.

geospatial data -- information that identifies the geographic location and characteristics of natural or constructed features and boundaries on the earth. This information may be derived from, among other things, remote sensing, mapping, and surveying technologies.

graph -- a set of topologically interrelated zero-dimensional (node), one-dimensional (link or chain), and sometimes two-dimensional (GT-polygon) objects that conform to a set of defined constraint rules. Numerous rule sets can be used to distinguish different types of graphs. Three such types, planar graph, network, and two-dimensional manifold, are used in this standard. All three share the following rules: each link or chain is bounded by an ordered pair of nodes, not necessarily distinct; a node may bound one or more links or chains; and links or chains may only intersect at nodes. Planar graphs and networks are two specialized types of graphs, and a two-dimensional manifold is an even more specific type of planar graph.

grid -- (1) a set of grid cells forming a regular, or nearly regular, tessellation of a surface; (2) a set of points arrayed in a pattern that forms a regular, or nearly regular, tessellation of a surface. The tessellation is regular if formed by repeating the pattern of a regular polygon, such as a square, equilateral triangle, or regular hexagon. The tessellation is nearly regular if formed by repeating the pattern of an "almost" regular polygon such as a rectangle, non-square parallelogram, or non-equilateral triangle.

grid cell -- a two-dimensional object that represents the smallest nondivisible element of a grid.

GT-polygon -- an area that is an atomic two-dimensional component of one and only one two-dimensional manifold. The boundary of a GT-polygon may be defined by GT-rings created from its bounding chains. A GT-polygon may also be associated with its chains (either the bounding set, or the complete set) by direct reference to these chains. The complete set of chains associated with a GT-polygon may also be found by examining the polygon references on the chains.

GT-ring -- a ring created from complete and (or) area chains.

horizontal -- tangent to the geoid or parallel to a plane that is tangent to the geoid.

implicit -- method of identifying positions by a place in an array of values.

interior area -- an area not including its boundary.

label point -- a reference point used for displaying map and chart text (e.g., feature names) to assist in feature identification.

latitude -- angular distance measured on a meridian north or south from the equator.

layer -- an integrated, areally distributed, set of spatial data usually representing entity instances within one theme, or having one common attribute or attribute value in an association of spatial objects. In the context of raster data, a layer is specifically a two-dimensional array of scalar values associated with all of part of a grid or image.

line -- a generic term for a one-dimensional object.

line segment -- a direct line between two points.

link -- a topological connection between two nodes. A link may be directed by ordering its nodes.

longitude -- angular distance between the plane of a meridian east or west from the plane of the meridian of Greenwich.

map -- a spatial representation, usually graphic on a flat surface, of spatial phenomena.

media -- the physical devices used to record, store, and (or) transmit data.

meridian -- a great circle on the Earth that passes through the geographic poles.

metadata -- data about the content, quality, condition, and other characteristics of data.

National Geospatial Data Clearinghouse -- a distributed network of geospatial data producers, managers, and users linked electronically. Building on initiatives such as the national information infrastructure, the clearinghouse uses a distributed, electronically connected network, such as the Internet. Each data provider will describe available data in an electronic form, and provide these descriptions (or "metadata") using means that can be accessed over a communications network. Thus, the data for the clearinghouse are located at the sites of data producers (or, where more efficient, at the sites of intermediaries) throughout the country. Using the network, users will search these descriptions to locate data that are suitable for their applications.

network -- a graph without two dimensional objects. If projected onto a two-dimensional surface, a network can have either more than one node at a point and (or) intersecting links or chains without corresponding nodes.

network chain -- a chain that explicitly references start and end nodes and not left and right polygons. It is a component of a network.

node -- a zero-dimensional object that is a topological junction of two or more links or chains, or an end point of a link or chain.

Node, Topology Level 0 -- VPF term for a point (in SDTS, a "point").

Node, Topology Level 1 -- VPF term for a node on a network (in SDTS, a "node, network").

Node, Topology Level 2 -- VPF term for a node on a planar graph (in SDTS, a "node, planar graph").

Node, Topology Level 3 -- VPF term for a point used to represent isolated features. These are topologically linked to a containing face.

object -- a digital representation of all or part of an entity instance.

ordinate -- the coordinate of a point in a plane cartesian coordinate system obtained by measuring parallel to the y-axis ("the 'y' value").

phenomenon -- a fact, occurrence or circumstance. Route 10, George Washington National Forest, and Chesterfield County are all phenomena.

pixel -- two-dimensional picture element that is the smallest nondivisible element of a digital image.

planar graph -- the node and link or chain objects of the graph occur or can be represented as though they occur upon a planar surface. Not more than one node may exist at any given point on the surface. Links or chains may only intersect at nodes.

point -- a zero-dimensional object that specifies geometric location. One coordinate pair or triplet specifies the location. Area point, entity point, and label point are special implementations of the general case.

primitive -- the quality of not being subdivided; atomic.

quality -- an essential or distinguishing characteristic necessary for cartographic data to be fit for use.

raster -- one or more overlapping layers for the same grid or digital image.

raster object - one or more images and/or grids, each grid or image representing a layer, such that corresponding grid cells and/or pixels between layers are congruent and registered.

resolution -- the minimum difference between two independently measured or computed values which can be distinguished by the measurement or analytical method being considered or used.

ring -- sequence of nonintersecting chains or strings and (or) arcs, with closure. A ring represents a closed boundary, but not the interior area inside the closed boundary.

SDTS -- the Spatial Data Transfer Standard defined by Department of Commerce, 1992, Spatial Data Transfer Standard (SDTS) (Federal Information Processing Standard 173): Washington, Department of Commerce, National Institute of Standards and Technology.

spatial data -- see geospatial data.

stratum -- one of a series of layers, levels, or gradations in an ordered system. For this standard, the term is used in the sense of (1) a region of sea, atmosphere, or geology that is distinguished by natural or arbitrary limits; (2) a socioeconomic level of society comprised of persons of the same or similar status, especially with regard to education or culture; or (3) a layer of vegetation, usually of the same or similar height.

string -- a connected nonbranching sequence of line segments specified as the ordered sequence of points between those line segments. Note: A string may intersect itself or other strings.

two-dimensional manifold -- a planar graph and its associated two dimensional objects. Each chain bounds two and only two, not necessarily distinct, GT-polygons. The GT-polygons are mutually exclusive and completely exhaust the surface.

type -- in the definition of the elements in the metadata standard, a compound element has the type "compound" to provide a unique way to identify compound elements. For a data element, the type identifies the kind of value that can be assigned to the data element. The choices are "integer" for integer numbers, "real" for real numbers, "text" for ASCII characters, "date" for day of the year, and "time" for time of the day.

universe polygon -- defines the part of the universe that is outside the perimeter of the area covered by other GT-polygons ("covered area") and completes the two-dimensional manifold. This polygon completes the adjacency relationships of the perimeter links. The boundary of the universe polygon is represented by one or more inner rings and no outer ring. Attribution of the universe polygon may not exist, or may be substantially different from the attribution of the covered area.

vector -- composed of directed lines.

vertical -- at right angles to the horizontal; includes altitude and depth.

VPF -- the Vector Product Format defined by Department of Defense, 1992, Vector Product Format (MIL-STD-600006): Philadelphia, Department of Defense, Defense Printing Service Detachment Office.

void polygon -- defines a part of the two-dimensional manifold that is bounded by other GT-polygons, but otherwise has the same characteristics as the universe polygon. The geometry and topology of a void polygon are those of a GT-polygon. Attribution of a void polygon may not exist, or may be substantially different from the attribution of the covered area.

voxel -- a three-dimensional element that is the smallest nondivisible element of a digital volume.

Alphabetical List of Compound Elements and Data Elements

| | |
|---|--|
| Abscissa Resolution 29 | Codeset Domain 35 |
| Abstract 4 | Codeset Name 35 |
| Access Constraints 7 | Codeset Source 35 |
| Access Instructions 41 | Column Count 17 |
| Address 52 | Compatibility Information 42 |
| Address Type 52 | Completeness Report 10 |
| Albers Conical Equal Area 24 | Compression Support 41 |
| Altitude Datum Name 31 | Computer Contact Information 40 |
| Altitude Distance Units 31 | Contact Address 52 |
| Altitude Encoding Method 31 | Contact Electronic Mail Address 52 |
| Altitude Resolution 31 | Contact Facsimile Telephone 52 |
| Altitude System Definition 31 | Contact Information 51 |
| ARC Coordinate System 28 | Contact Instructions 53 |
| ARC System Zone Identifier 28 | Contact Organization 51 |
| Attribute 34 | Contact Organization Primary 51 |
| Attribute Accuracy 10 | Contact Person 51 |
| Attribute Accuracy Explanation 10 | Contact Person Primary 51 |
| Attribute Accuracy Report 10 | Contact Position 52 |
| Attribute Accuracy Value 10 | Contact TDD/TTY Telephone 52 |
| Attribute Definition 34 | Contact Voice Telephone 52 |
| Attribute Definition Source 34 | Coordinate Representation 29 |
| Attribute Domain Values 34 | Country 52 |
| Attribute Label 34 | Cross Reference 8 |
| Attribute Measurement Frequency 36 | Currentness Reference 5 |
| Attribute Measurement Resolution 35 | Custom Order Process 43 |
| Attribute Units of Measurement 35 | |
| Attribute Value Accuracy 36 | Data Quality Information 9 |
| Attribute Value Accuracy Explanation 36 | Data Set Credit 8 |
| Attribute Value Accuracy Information 36 | Data Set G-Polygon 6 |
| Available Time Period 43 | Data Set G-Polygon Exclusion G-Ring 6 |
| Azimuth Measure Point Longitude 26 | Data Set G-Polygon Outer G-Ring 6 |
| Azimuthal Angle 26 | Denominator of Flattening Ratio 31 |
| Azimuthal Equidistant 24 | Depth Datum Name 31 |
| | Depth Distance Units 32 |
| Bearing Reference Direction 30 | Depth Encoding Method 32 |
| Bearing Reference Meridian 30 | Depth Resolution 32 |
| Bearing Resolution 30 | Depth System Definition 31 |
| Bearing Units 30 | Description 4 |
| Beginning Date 49 | Detailed Description 34 |
| Beginning Date of Attribute Values 35 | Dialup File Name 41 |
| Beginning Time 49 | Dialup Instructions 41 |
| Bounding Coordinates 5 | Dialup Telephone 41 |
| Browse Graphic 7 | Digital Form 38 |
| Browse Graphic File Description 8 | Digital Transfer Information 38 |
| Browse Graphic File Name 7 | Digital Transfer Option 40 |
| Browse Graphic File Type 8 | Direct Spatial Reference Method 15 |
| | Distance and Bearing Representation 29 |
| Calendar Date 49 | Distance Resolution 30 |
| Citation 4 | Distribution Information 37 |
| Citation Information 47 | Distribution Liability 38 |
| City 52 | Distributor 38 |
| Cloud Cover 13 | |

| | | | |
|--|----|---|----|
| East Bounding Coordinate | 5 | Lambert Azimuthal Equal Area | 24 |
| Edition | 48 | Lambert Conformal Conic | 24 |
| Ellipsoid Name | 31 | Landsat Number | 27 |
| Ending Date | 50 | Larger Work Citation | 48 |
| Ending Date of Attribute Values | 36 | Latitude of Projection Center | 26 |
| Ending Time | 50 | Latitude of Projection Origin | 25 |
| Entity and Attribute Detail Citation | 36 | Latitude Resolution | 24 |
| Entity and Attribute Information | 33 | Lineage | 12 |
| Entity and Attribute Overview | 36 | Local | 30 |
| Entity Type | 34 | Local Description | 30 |
| Entity Type Definition | 34 | Local Georeference Information | 30 |
| Entity Type Definition Source | 34 | Local Planar | 29 |
| Entity Type Label | 34 | Local Planar Description | 29 |
| Enumerated Domain | 34 | Local Planar Georeference Information | 29 |
| Enumerated Domain Value | 34 | Logical Consistency Report | 10 |
| Enumerated Domain Value Definition | 35 | Longitude of Central Meridian | 25 |
| Enumerated Domain Value Definition Source | 35 | Longitude of Projection Center | 25 |
| Equidistant Conic | 24 | Longitude Resolution | 24 |
| Equirectangular | 24 | Lowest BPS | 41 |
| False Easting | 25 | Maintenance and Update Frequency | 5 |
| False Northing | 25 | Map Projection | 24 |
| Fees | 42 | Map Projection Name | 24 |
| File Decompression Technique | 40 | Mercator | 24 |
| Format Information Content | 40 | Metadata | 1 |
| Format Name | 39 | Metadata Access Constraints | 46 |
| Format Specification | 40 | Metadata Contact | 45 |
| Format Version Date | 40 | Metadata Date | 45 |
| Format Version Number | 40 | Metadata Future Review Date | 45 |
| G-Ring Latitude | 6 | Metadata Reference Information | 45 |
| G-Ring Longitude | 6 | Metadata Review Date | 45 |
| General Vertical Near-sided Projection | 24 | Metadata Security Classification | 46 |
| Geodetic Model | 30 | Metadata Security Classification System | 46 |
| Geographic | 23 | Metadata Security Handling Description | 46 |
| Geographic Coordinate Units | 24 | Metadata Security Information | 46 |
| Geospatial Data Presentation Form | 48 | Metadata Standard Name | 45 |
| Gnomonic | 24 | Metadata Standard Version | 45 |
| Grid Coordinate System | 27 | Metadata Time Convention | 46 |
| Grid Coordinate System Name | 27 | Metadata Use Constraints | 46 |
| Height of Perspective Point Above Surface | 25 | Miller Cylindrical | 24 |
| Highest BPS | 41 | Modified Stereographic for Alaska | 24 |
| Horizontal Coordinate System Definition | 23 | Multiple Dates/Times | 49 |
| Horizontal Datum Name | 30 | Native Data Set Environment | 8 |
| Horizontal Positional Accuracy | 11 | Network Address | 40 |
| Horizontal Positional Accuracy Explanation | 11 | Network Resource Name | 41 |
| Horizontal Positional Accuracy Report | 11 | Non-digital Form | 38 |
| Horizontal Positional Accuracy Value | 11 | North Bounding Coordinate | 5 |
| Hours of Service | 52 | Number DataBits | 41 |
| Identification Information | 3 | Number StopBits | 41 |
| Indirect Spatial Reference | 15 | Oblique Line Azimuth | 26 |
| Issue Identification | 48 | Oblique Line Latitude | 26 |
| Keywords | 6 | Oblique Line Longitude | 26 |
| | | Oblique Line Point | 26 |

| | |
|--|--|
| Oblique Mercator 24 | Recording Capacity 42 |
| Offline Media 42 | Recording Density 42 |
| Offline Option 42 | Recording Density Units 42 |
| Online Computer and Operating System 42 | Recording Format 42 |
| Online Linkage 48 | Resource Description 38 |
| Online Option 40 | Robinson 24 |
| Ordering Instructions 42 | Row Count 17 |
| Ordinate Resolution 29 | |
| Originator 47 | Scale Factor at Center Line 26 |
| Orthographic 24 | Scale Factor at Central Meridian 27 |
| Other Citation Details 48 | Scale Factor at Equator 25 |
| Other Grid System's Definition 29 | Scale Factor at Projection Origin 26 |
| Other Projection's Definition 27 | SDTS Point and Vector Object Type 16 |
| Overview Description 36 | SDTS Terms Description 15 |
| | Security Classification 8 |
| Parity 41 | Security Classification System 8 |
| Path Number 27 | Security Handling Description 8 |
| Place 6 | Security Information 8 |
| Place Keyword 7 | Semi-major Axis 31 |
| Place Keyword Thesaurus 6 | Series Information 48 |
| Planar 24 | Series Name 48 |
| Planar Coordinate Encoding Method 29 | Single Date/Time 49 |
| Planar Coordinate Information 29 | Sinusoidal 24 |
| Planar Distance Units 30 | Source Citation 12 |
| Point and Vector Object Count 16 | Source Citation Abbreviation 12 |
| Point and Vector Object Information 15 | Source Contribution 12 |
| Point of Contact 7 | Source Currentness Reference 12 |
| Polar Stereographic 24 | Source Information 12 |
| Polyconic 24 | Source Produced Citation Abbreviation 13 |
| Positional Accuracy 11 | Source Scale Denominator 12 |
| Postal Code 52 | Source Time Period of Content 12 |
| Process Contact 13 | Source Used Citation Abbreviation 13 |
| Process Date 13 | South Bounding Coordinate 6 |
| Process Description 12 | Space Oblique Mercator (Landsat) 24 |
| Process Step 12 | Spatial Data Organization Information 15 |
| Process Time 13 | Spatial Domain 5 |
| Progress 5 | Spatial Reference Information 19 |
| Publication Date 47 | SPCS Zone Identifier 28 |
| Publication Information 48 | Standard Order Process 38 |
| Publication Place 48 | Standard Parallel 25 |
| Publication Time 47 | State or Province 52 |
| Publisher 48 | State Plane Coordinate System 28 |
| Purpose 4 | Status 5 |
| | Stereographic 24 |
| Quantitative Attribute Accuracy Assessment 10 | Straight Vertical Longitude from Pole 26 |
| Quantitative Horizontal Positional Accuracy Assessment 11 | Stratum 7 |
| Quantitative Vertical Positional Accuracy Assessment 11 | Stratum Keyword 7 |
| | Stratum Keyword Thesaurus 7 |
| Range Domain 35 | Supplemental Information 5 |
| Range Domain Maximum 35 | |
| Range Domain Minimum 35 | Technical Prerequisites 43 |
| Range of Dates/Times 49 | Temporal 7 |
| Raster Object Information 17 | Temporal Keyword 7 |
| Raster Object Type 17 | Temporal Keyword Thesaurus 7 |
| | Theme 6 |
| | Theme Keyword 6 |

Theme Keyword Thesaurus 6
 Time of Day 49
 Time Period Information 49
 Time Period of Content 5
 Title 47
 Transfer Size 40
 Transverse Mercator 24
 Turnaround 42
 Type of Source Media 12

 Universal Polar Stereographic 28
 Universal Transverse Mercator 27
 Unrepresentable Domain 35
 UPS Zone Identifier 28
 Use Constraints 7
 UTM Zone Number 28

 van der Grinten 24
 Vertical Coordinate System Definition 31
 Vertical Count 17
 Vertical Positional Accuracy 11
 Vertical Positional Accuracy Explanation 11
 Vertical Positional Accuracy Report 11
 Vertical Positional Accuracy Value 11
 VPF Point and Vector Object Type 16
 VPF Terms Description 16
 VPF Topology Level 16

 West Bounding Coordinate 5

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Dodd, Susan, 1982, Catalog Data Presentation Form 48
Gnomonic 24
Grid Coordinate System 27
Grid Coordinate System Name 27

Height of Perspective Point Above Surface 25
Highest BPS 41
Horizontal Coordinate System Definition 23
Horizontal Datum Name 30
Horizontal Positional Accuracy 11
Horizontal Positional Accuracy Explanation 11
Horizontal Positional Accuracy Report 11
Horizontal Positional Accuracy Value 11
Hours of Service 52

Identification Information 3
Indirect Spatial Reference 15
Issue Identification 48

Kgs, remote sensing, mapping, and surveying technologies.

graph -- a set of topologically interrelated zero-dimensional (node), one-dimensional (link or chain), and sometimes two-dimensional (GT-polygon) objects that conform to a set of defined constraint rules. Numerous rule sets can be used to distinguish different types of graphs. Three such types, planar graph, network, and two-dimensional manifold, are used in this standard. All three share the following rules: each link or chain is bounded by an ongoing machine-readable data files: Chicago, American Library Association.

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